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LANDSCAPE PERCEPTION IN THE
CROWSNEST PASS AREA, ALBERTA

by



WESLEY FRED HADIKIN

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
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FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read,
and recommend to the Faculty of Graduate Studies and
Research for acceptance, a thesis entitled "Landscape
Perception in the Crowsnest Pass Area, Alberta,"
submitted by Wesley Fred Hadikin in partial fulfilment
of the requirements for the degree of Master of Science.

ABSTRACT

This study has investigated some of the land use related problems in the Crowsnest Pass Area by assessing public perceptions and attitudes towards the landscape. In particular two major themes were explored. First, the people's perception of tourist and recreational development as a viable supplement to the coal economy. Second, their perception of the environmental impact induced by surface coal mining operations.

Two groups of the public were sampled. The local people who lived in the study area and the visitors who were classified as either tourists or recreationists. A selected group of resource management officials was also sampled. These officials were viewed as representing the best informed sector of the public.

Both the "local" and "visitor" groups viewed the landscape as being "very attractive." Perceived elements that enhanced the quality of the landscape were listed as "outstanding scenic beauty" and "good recreational capability." The majority of the respondents felt that the area had "great potential" for tourist and recreational development.

Both the residents and tourists did not perceive surface mining damage as a major problem when compared

to other problems of an urban nature. The majority of the local people regarded surface mining as compatible with tourist and recreational land use. They tended to perceive surface mining and its effects as isolated and "somewhat serious." An idealized view that reclamation would restore the disturbed landscape to its original state was expressed by many of the local residents. The resource management officials and recreationists held the opposite opinion. They perceived surface mining damage as a "serious" problem that was interfering with the area's recreational potential. The resource officials perceived surface coal mining and recreational land use as incompatible in the study area.

The analysis of "visitor" user characteristics and perceptions revealed a high regard for future tourist and recreational development. However, if the study area is to benefit economically, tourist activity must be encouraged and the urban corridor established as a focal point of activity. Study findings suggest means of achieving this aim.

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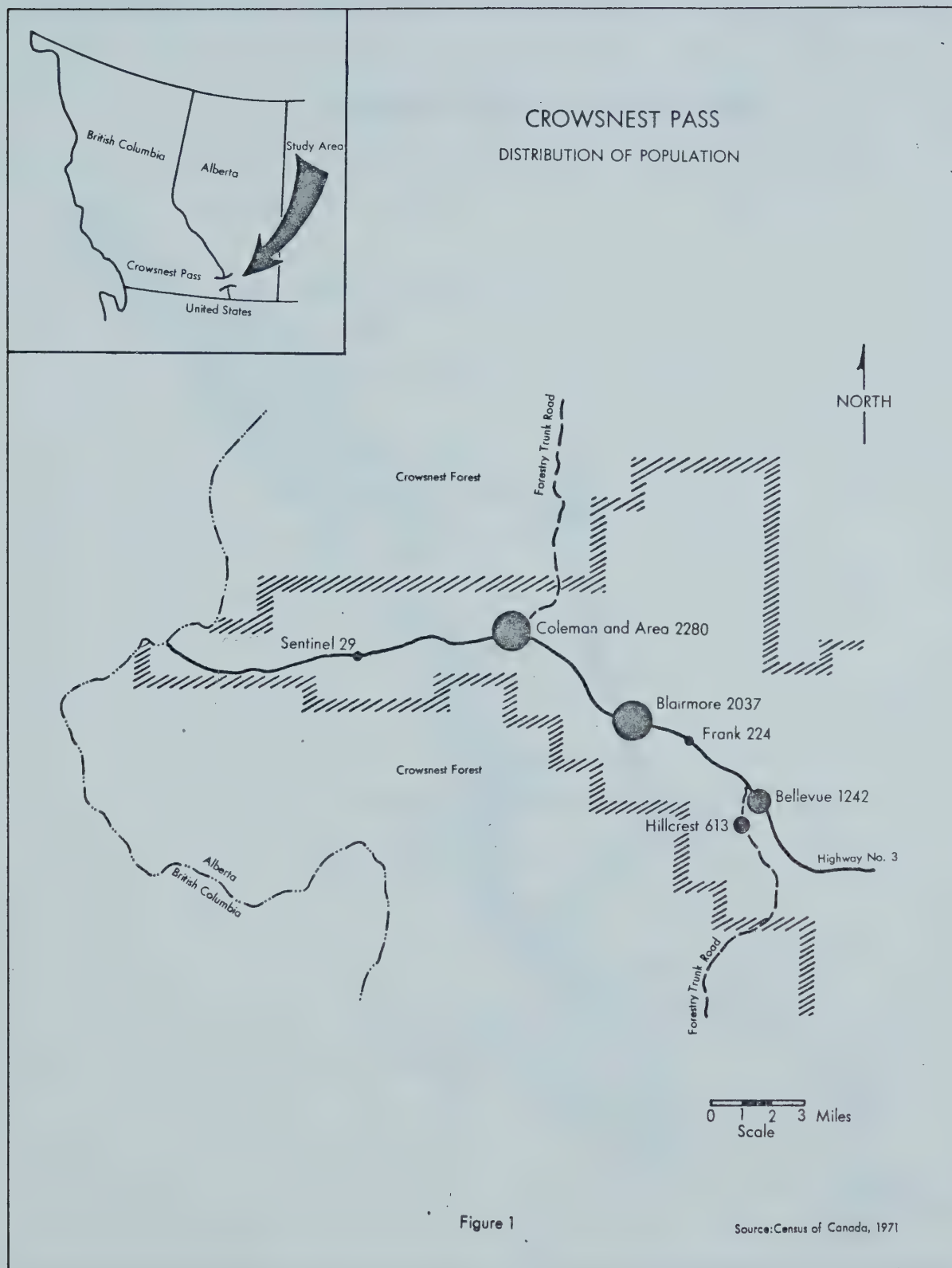
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CHAPTER I

INTRODUCTION

THE CROWSNEST PASS STUDY AREA

The Crowsnest Pass is located in southwestern Alberta adjacent to the Alberta-British Columbia provincial boundary. As the name suggests, the Pass is an east-west route through the Rocky Mountains that connects the Alberta Plains and the British Columbia interior. This study is restricted to the Alberta portion of the Crowsnest Pass that runs some twenty miles east from the provincial boundary. Provincial Highway Number 3, otherwise known as the Pass route, provides the only major road access to the area and most of the communities either border or straddle the highway. Practically the total urban population of the Pass resides in three towns, Bellevue, Blairmore, and Coleman, and two villages, Hillcrest and Frank (Fig. 1). The total population of these urban areas is 6,396 (Census of Canada, 1971). The entire study area can be viewed as cut in half by the Pass and extending some thirty-five miles north and south of the twenty-mile east-west thoroughfare. This make the total area under study approximately 1400 square miles and includes a considerable portion of the 1700 square mile Crowsnest Forest Reserve (Fig. 2). In this respect the



REGIONAL LOCATION OF STUDY AREA

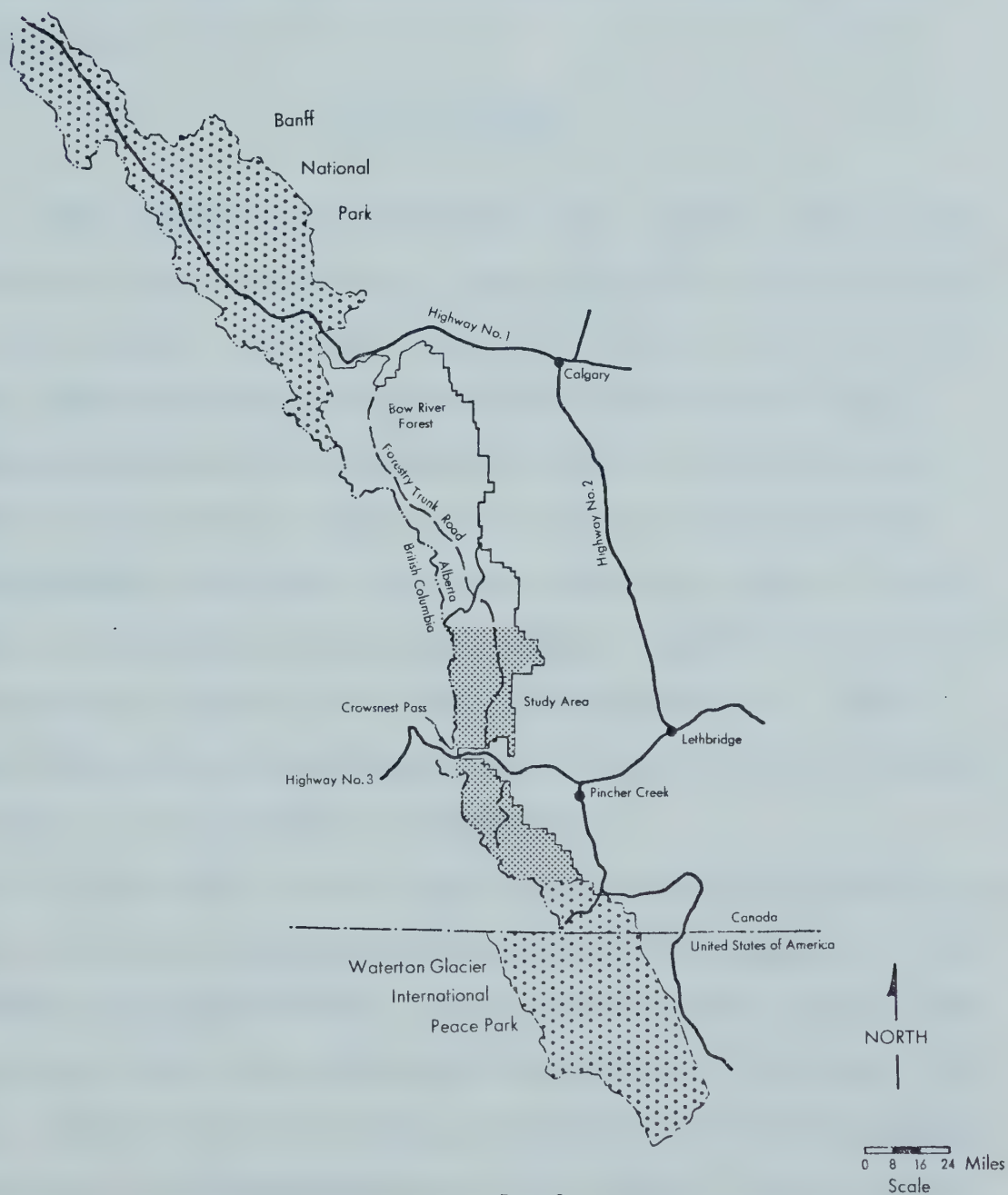


Figure 2

Crowsnest Pass Study Area can be viewed as two segments. First, the actual Pass route area that contains most of the population but is not part of the Forest Reserve. Second, the Forest Reserve portion that runs both north and south of the Pass route and contains almost no urban or rural population.

THE PROBLEMS

The traditional and present day economic base of the Crowsnest Pass Study Area is the extraction and processing of the natural resources, in particular the coal deposits. This reliance on the coal economy and the actual coal mining operation has affected the area in two main ways. First, the area has experienced several socio-economic fluctuations coincident with the demand for coal. Second, the various phases of the coal mining operation have had a detrimental impact on the physical environment. These socio-economic and environmental problems exist at present and may be accentuated in the future.

A necessity in the study area is the development of a more evenly distributed economic base with emphasis on environmental preservation. It is the author's opinion that a greater focus on tourist and recreational land use, with less emphasis on coal mining, particularly surface mining, could aid in alleviating the major problems faced by the study area. The use of a perception study, based on a

questionnaire, is one means of evaluating this opinion. It also provides an insight into the relationship between recreational and tourist development and its main land use competitor, coal mining. In this respect the study attempts to assess the perceptions and attitudes of the public concerning the landscape, its use, and future development. The gathered information could then be used as an input in formulating land use development policies in the study area.

THE PEOPLE INVOLVED

In the past there have been efforts made to assess public opinion relating to certain aspects of coal mining in the study area (Environment Conservation Authority, 1971). These surveys have been mainly in the form of public hearings and can be questioned as to how representative they are of public views. As Sewell (1971, p. 127) points out, "They have severe limitations, however, as a means of determining public preferences. Usually they attract only those people who have an obvious stake in the issue."

At any one time the total population of the study area is made up of two groups. They are:

1. The local people who live in the study area.
2. The visitors, who can be classified as tourists or recreationists.

Tourist activity is restricted mainly to the

east-west corridor of the study area. In the majority of the cases the tourists, while passing through to a specified destination, may stop for a short time to observe some of the attractions along the route. The recreationists, on the other hand, have come to the study area with the express purpose of indulging in one or more recreational activities. These activities are usually accommodated in the Forest Reserve portion of the study area and the length of stay is often more than a day.

In order to obtain a cross section of public response, both the "local" and "visitor" groups are sampled along with a selected group of resource management officials. Although the management group are not considered part of the public they can be viewed as representing the best informed sector of the public.

STUDY OBJECTIVES

In order to obtain an insight into the individuals' perception of space and use related problems, it was necessary to formulate four broad categories of objectives. These are:

1. To obtain some measures of landscape attractiveness and identify those features (natural or man-made) that either contribute to or detract from the landscape attractiveness.
2. To determine the attitudes and perceptions held towards certain aspects of coal mining land use.

3. To examine attitudes concerning possible land use alternatives, perceived conflicts, and future development.
4. To determine if any particular socio-economic variables correlate with the perceptions and attitudes expressed by the public.

Because of certain assumptions made, not all four categories of objectives pertain to each sampled group of the public. Chapter III outlines in detail how the above objectives were approached and the assumptions formulated.

DEFINITIONS

Since many terms are repeatedly used in the text, it is appropriate to briefly discuss the meaning of each term and how it is utilized in the study.

Perception

The term "perception" is often used but there is sometimes little agreement on what the term means. Schiff (1970, p. 1) has broken perception down into two categories. The physical aspects of perception deal with the physical properties of the senses. In this case the neurological and physical aspects of perception are stressed. Bartley states that perception ". . . is the overall activity of the organism that immediately follows or accompanies energistic impingements upon the sense organs" (Bartley, 1958, p. 22). This may be viewed as the

psychologist's definition of perception that relates almost exclusively to sensory stimulus and response. The second category, primarily dealing with the environment, is referred to as social perception. This segment of perception has been adopted by geographers who feel it should be concerned more with social and cultural factors than with neurological and physiological aspects. As Tajfel suggests "social perception is concerned with the effects of social and cultural factors on man's structuring of his physical and social environment." (Tajfel, 1968, p. 567.)

Attitudes

At times perceptions and attitudes may be confused, for both develop as a result of past experience and affect each other. Perceptions are viewed as more transitory than attitudes, less stable and more subject to change with the respondents whims. An attitude is more stable and is viewed as representing individual feelings towards and beliefs about, certain issues or objects.

Recreation

Clawson and Knetsch define recreation as:

. . . activity (or planned inactivity) undertaken because one wants to do it. In a deeper psychological sense, recreation refers to the human emotional and inspirational experience arising out of the recreation act; we use the latter to stand for the whole. Recreation contrasts with work, which is done primarily to earn money or otherwise to provide the "necessities" of life, . . . (1966, p.6).

The "recreationist" can be defined as one who partakes in recreational activity. In this study, the recreationist is viewed as a person who has come to the area, as opposed to another destination, with the express purpose of pursuing some recreational activity.

Tourism

Lickorish (1970, p. 166) states,

Tourism is a part of recreation activity. It is a concept which is difficult to define precisely, but broadly, it represents the movement of people, a market rather than an industry, and, in general, the incidence of a mobile population on any given reception area and its resident population."

For the purpose of the study the tourist is defined as that person who is passing through the area towards another destination but may stop, for a short time, to observe some of the points of interest along the route.

Landscape

Landscapes are defined the way they are perceived.

The architect or planner may think of landscape in his own particular way. The layman may associate the term with his individual experiences. For this study, landscape is adopted to mean the quality or character of a region as a whole areal situation. To obtain this character or quality of a region it is necessary to look at its parts. As Tuan suggests, "To receive and then to give the full flavor of a landscape we first need to concentrate on its parts: its

climate, landforms, seasonal coloring, history, land use, architecture, and the like" (Tuan, 1960, p. 32). Since perceptions among people differ, it is possible to obtain contrasting landscape images from different people looking at the same area.

Surface Mining and Reclamation

Stated in the simplest terms, surface mining consists of nothing more than removing (stripping) the topsoil, rock, and other strata that lie above the mineral, or fuel to be recovered. Reclamation is used to mean the restoring or reclaiming of the surface areas disturbed by surface mining. There are different degrees of reclamation and restoration of original surfaces, and original surface uses may or may not be physically or economically possible.

CHAPTER II

ENVIRONMENTAL PERCEPTION

MAN-ENVIRONMENT RESEARCH IN GEOGRAPHY

The relationship between man and his environment has been a favorite theme for geographic research. Traditional studies along this theme placed emphasis on different aspects of the relationship. Certain studies focused on the influence that the environment had on man. This emphasis, outlined by Ratzel and adopted by Semple (1911), gave rise to "environmental determinism," the belief that environmental factors determined what happened. Others felt that the "man element" was an important variable and that geographers should look at the adjustments man made to his environment. Taking this approach Barrows recommended that the aim of geographers should be:

. . . to make clear the relationship existing between natural environments and the distribution and activities of man. Geographers view this problem in general from the standpoint of man's adjustments to environment, rather than from that of environmental influences (Barrows, 1923, p. 1).

A supplementary theme to this approach placed the emphasis on how man altered his physical environment and how this brought about a change of attitudes towards the environment. In this respect Glacken (1956) traced the changing

ideas and attitudes towards the earth from early written work to the present.

These early attempts at using environmental studies for explanations in geography usually centered around cultural and historical geography and applied the concepts in a general way to describe whole cultures. The studies did not explore or consider that man-environment relationships and their resultant spatial patterns were dependent on perceptual interpretation.

Recent man-environment studies have taken as their basis the concept which assumes that a person reacts to his environment as he perceives and interprets it in the light of his previous experiences. Kirk (1952) was one of the first to present a methodological discussion along the lines of recent concepts of perception in geography.* It was his contention that facts or phenomena of the environment were utilized only after passing through the subjective cultural filters associated with individual and social values. He worked towards a more applicable concept of the man-environment relationship and believed that a focus on the behavioral environment could help alleviate some of the

*Kirk's initial ideas were first published in 1952, Indian Geographical Journal, Silver Jubilee Edition, (ed.) George Kuriyan, pp. 152-160, and later expanded in "Problems of Geography," Geography, Volume 40, No. 4, pp. 357-372.

problems encountered in previous studies. Following the same theme Lowenthal concentrated on the roles and relationships that geographic thought was concerned with:

My epistemological inquiry . . . is concerned with all geographical thought, scientific and other: how it is acquired, transmitted, altered, and integrated into conceptual systems: and how the horizon of geography varies among individuals and groups (Lowenthal, 1961, p. 241).

Sadler's model (1970, p. 2) includes the methodological concepts discussed by Kirk and Lowenthal but adds an operational component to the man-environment relationship (Fig. 3). The "real" environment is defined as composing all physical and social phenomena that actually exist on the earth's surface. The operational environment is that part of the real environment where man acts. The perceived environment is congruent with the "real" environment but is interpreted through subjective influences. Since the environment is utilized and altered on the basis of the perceptions people have of it, there is a need to determine what these perceptions are.

PRACTICAL PERCEPTION STUDIES

Perception studies of natural hazards can be credited with the single strongest research tradition that stressed practical aspects. These studies focused on the occupants perception, adaptation, and adjustment to such natural hazards as floods and droughts. White's paper (1945) concentrated on the physical factors that affected such adjustments. Subsequent studies examined the

A MODEL OF THE ROLE OF PERCEPTION IN MAN-ENVIRONMENT INTERACTION

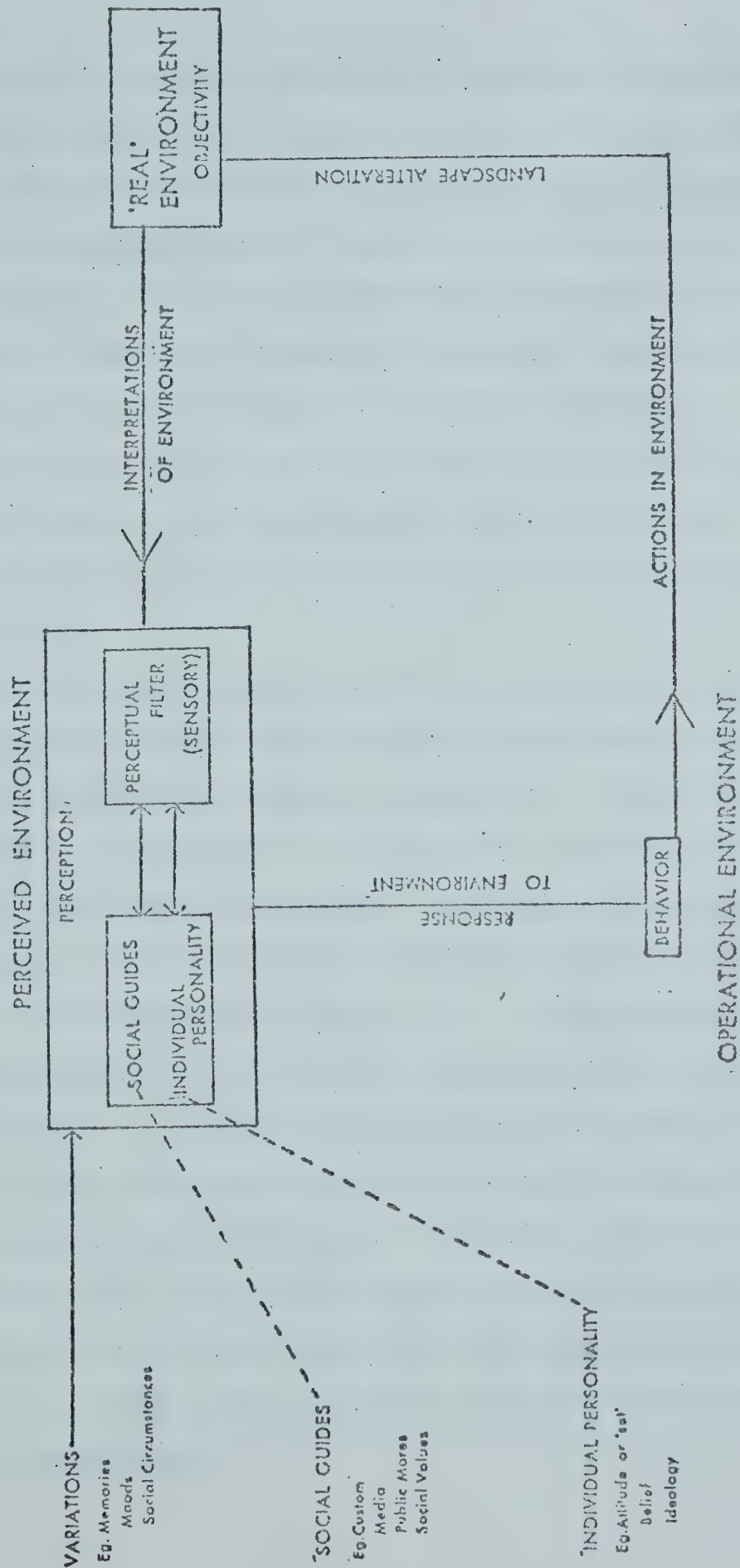


Figure 3
Source: Sadler 1970 p. 2A

interaction of social, economic, and behavioral variables with the patterns of flood plain occupancy (Burton, 1961). Kates' (1962) study entitled Hazard and Choice Perception in Flood Plain Management, concentrated more directly on the perception of the flood hazard and the range of choice as related to the decision-making process. As stated by Kates, "The studies of hazard and choice perception reported in this volume throw new light on the conditions under which men occupy floods plains and, at the same time, yield empirical evidence on the decision-making process" (1962, p. 1).

Developing from this body of natural hazard research, were perception studies that tended to focus more directly on various aspects of resource management. These studies underlined the importance of taking into consideration both individual and resource managers' perception of certain situations. In his own research Saarinen (1966, p. 36) stresses this importance stating, ". . . any attempt, by resource managers, to change the behavior of the Great Plains Farmer . . . would probably be unsuccessful if they failed to take into consideration his positive perception of environmental possibilities." Similarly, MacIver (1970) examined the role of various groups in a resource management situation and found that they often differed in their perceptions of the problem and the courses of action that should be considered.

The natural hazard studies and their derivatives enabled other geographers to utilize the concept of perception in an applied way. Wood (1970) lists five other such areas of relevant study within geography. These are: (1) landscape studies; (2) recreational studies; (3) urban studies; (4) movement studies, and (5) space preference studies. The rest of this chapter will now focus on one of these areas, in particular, landscape studies.

LANDSCAPE PERCEPTION STUDIES

Landscape perception studies can be classified in a number of ways. For example, they may be classified according to the type of landscape perceived, such as wilderness or urban landscapes. Similarly, landscape studies may be filed under the field of investigation such as landscape studies in resource management or studies pertaining to the recreational aspects of the landscape. It is also possible to separate landscape studies into both theoretical/philosophical and practical divisions. Given all these possible classifications it is beyond the scope of this study to examine each category and adequately discuss the contributions made to geographic literature. Instead, the study will concentrate on the research in this field that has been typified by two types of approaches the phenomenological and the quantitative. Each approach is concerned with man's perception of the landscape and in

turn how his images, ideas, conceptions, and perceptions affect the landscape. Both of these methods deserve discussion under separate sections.

The Phenomenological Approach

The phenomenological approach is one way to determine the diversified views of the landscape. It has, as its basis, the whole range of phenomena. Lowenthal (1961 p. 241) hinted at this approach by stating that the subject matter of geography approximates the world of general disclosures, the everyday life of man on earth. Tuan (1971, p. 181) supports this introspective and subjective look at the whole range of phenomena rather than the "testable" part of it. He suggests, "A phenomenologist may say that the essence of human nature is not a thing that can be uncovered by objective science." One of the first studies in geography to implement the approach was that by a historical geographer, G. M. Lewis. He investigated the perceptions of three different groups of people who described the Great Plains area of the United States (1962). From their descriptions Lewis was able to point out that the concept of the "Great Plains" was erroneous in respect to its actual geomorphological character. Lowenthal and Prince (1965), in an attempt to explain the perceptions of the English landscape, focused on how landscape tastes affected the landscape. They concluded that

"Landscapes are formed by landscape tastes. People in any country see their terrain through preferred and accustomed spectacles, and tend to make it over as they see it" (1965, p. 186). Francaviglia (1970) came to a similar conclusion and noted in his thesis that the Mormon landscape is one which is unique because of the unique life-style of the Mormons. They perceived the visual patterns to be very much a part of their culture and their religion. Perhaps the most significant aspect of the phenomenological approach is that it can help bridge the gap between geography and other disciplines such as history, psychology, and philosophy. To this effect Lowenthal notes, ". . . all these fields contribute to our knowledge of how we see the world we live in, how vision and value affect action, and how action alters institutions" (1968, p. 88). The phenomenological approach in geography, having the whole range of phenomena as its basis, bridges these disciplines.

The Quantitative Approach

Recently there has been a growing number of attempts to develop more objective measures of the landscape. In order to achieve this aim the focus has been placed on certain landscape characteristics, such as scenic beauty, rather than regarding the whole range of landscape phenomena. The emphasis on objectivity has called upon the use of several different measurement methods and

usually statistical treatment of the data in the analysis stage. Because of this "quantifying" aspect the perception studies tend to be more objective although the data gathered is still subjective.

Two initial studies to quantify landscape values came from Great Britain. Linton emphasized the need for an objective approach in his assessment of Scottish scenery stating, "It is becoming increasingly important to attempt the evaluation of scenic resources in some objective and quantitative pattern . . ." (Linton, 1968, p. 221). He attempted to achieve this aim by selecting various basic elements that influence one's reaction to scenery arranging these in a hierarchy, and then mapping their distribution over an area, in this case, the Scottish highlands. Similarly, Fines (1968) approached the same aim by testing a group of people with photographs and then obtaining a world scale of values for scenic quality. The study conducted by Leopold (1969) was an attempt to quantify some elements of aesthetic appeal of a landscape while eliminating value judgments or personal preferences. The rationale behind the study was: landscapes which are unique, in the sense that they are different from others, may have as much significance to society as more common landscapes. Using an involved ranking scheme Leopold demonstrated that various landscapes can be separated according to aesthetic appeal. Shafer, Hamilton, and

Schmidt (1969) used statistical analysis to determine what quantitative variables in photographs of landscapes were significantly related to public preference. Using factor and multiple-regression analysis an equation was developed that used six variables and accounted for 66 per cent of the variation in preference scores for photographs of landscapes. It was felt that this equation could be used as a model to predict landscape preferences for a wide range of outdoor recreationists in different areas. Other studies (Amidon and Elsner, 1968) have been carried out using the computer to delineate certain landscape areas that possess specific qualities to the viewer.

In an attempt to be predictive the above studies are open to a variety of criticisms because the nature of the subject is extremely complex. Research in evaluating scenic beauty and human response to it is such that no generalizations can yet be made or methodology accepted. However, there has been an attempt to set up an initial methodological framework for quantitative measurement of landscape quality. Using slide presentations and actual field study three research papers published by the Regional Science Research Institute, investigated various perceptual aspects concerning the landscape. The first of the three studies analyzed the extent of agreement among observers on environmental attractiveness (Coughlin and Goldstein, 1970). The second study dealt with an analysis of

landscape characteristics relevant to preference (Rabinowitz and Coughlin, 1970). The third, and final study of the series, was an attempt at quantitative measurement of landscape quality (Rabinowitz and Coughlin, 1971). All three studies relied heavily on hypothesis testing and statistical correlation techniques in extracting interesting conclusions.

The quantitative approach to landscape perception studies has been valuable in pointing out what people view and prefer in a landscape. This contribution is essential to man's future, as Machinko states, . . . "the most necessary ingredient for creation of a desirable future environment is a vision of what we think that environment ought to be" (1971, p. 28).

CHAPTER III

RESEARCH PROCEDURE

Between the summer months of June 1972 and September 1972, two hundred ten personal interviews and six hundred twenty mail-back questionnaires were administered in the study area. The personal interviews were conducted, by the author and an assistant, on the basis of a structured questionnaire (Appendix I). The people interviewed were the residents of the five small communities located on the Alberta side of the Crowsnest Pass. The visitors were sampled by means of a mail-back questionnaire (Appendices II, III). The selected group of resource management officials were first interviewed on the basis of a structured questionnaire which was followed by an informal discussion session. The actual surveys were preceded by a pilot study that was conducted during May 1972.

SURVEY DESIGNS AND ADMINISTRATION

The residents of the study area were interviewed in their homes. The interviews lasted between fifteen and forty minutes. The interview was usually followed by an informal discussion period where additional comments were recorded. Since the majority of the population

in the five communities was 6,200 (Census of Canada, 1966) a sample of about two hundred was selected and considered to be statistically adequate (Walpole, 1968, p. 195). In order to obtain this desired number of samples a grid was superimposed on each community and a certain number of samples (respondents) were selected from each grid at random. The number of samples taken from each grid was dependent upon the population of that particular community. If the randomly selected respondent refused to co-operate then the house to the left of the respondent was sampled. If the respondent was not at home a second interview attempt was made, failing this the house on the right was selected. Fortunately, only nine people refused to co-operate and problems of non-response were minimized. In order to obtain a cross section of response, the interviews were conducted during the day as well as in the evenings in the hopes that no particular group, such as housewives, would be over-represented in the survey. In total two hundred four interviews were conducted in this manner. Three of the interviews were rejected on the basis of respondent's improper response.^x For compilation ease, one other interview was randomly selected and not used in the final analysis. This left two hundred questionnaires to be used in the analysis stage.

^x During the interview it was made obvious that the respondent did not take the survey seriously, and the responses reflected this attitude.

The study area contains eleven recreational sites in the Forest Reserve portion and three more sites outside the forest boundary along Highway Number 3 (Fig. 4). In order to sample the recreationists ten sites were selected, seven from the Forest Reserve Area and all three along the major route through the Pass. At each site an attempt was made to sample all the families present. The general procedure followed was to first hand out the questionnaire and envelope and then go over, verbally, the written instructions on the top of the questionnaire. The sampling was carried out on alternate days throughout the week. This was to insure that there would be no bias introduced by any particular group who recreate mainly on weekends. The sampling was also restricted to days with good weather so that the perceived landscape would be under the same climatic conditions. By sampling almost all the recreational areas in this manner it was felt that randomness of sample would be achieved and response bias kept to a minimum. In total two hundred seventy-five questionnaires were passed out and one hundred five were returned. This set the mail-back questionnaire return at approximately 38 per cent. In the final analysis three questionnaires were rejected because they were incomplete in whole or in part. For final data presentation two other questionnaires were

RECREATIONAL AREAS AND INTEREST POINTS

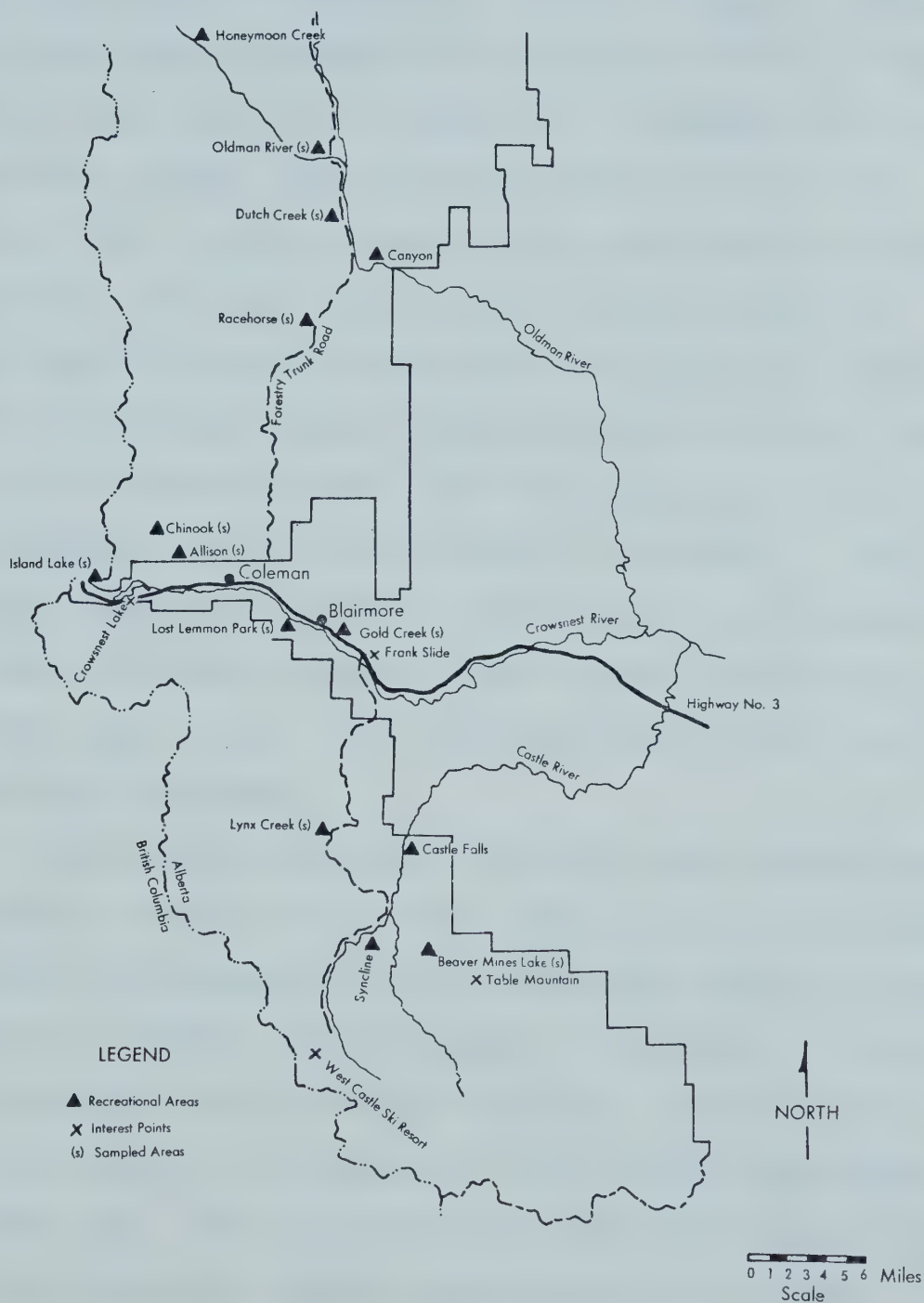


Figure 4

removed so that the total response would be one hundred.

The tourists were sampled at the Frank Slide, a historical point of interest on Highway Number 3. This particular point represents the geographic center of the Pass and was viewed as an ideal spot to sample the tourists that stopped. All the people who stopped at the site on their journey westward were administered a questionnaire. They were given explicit instructions to first drive through the area and then answer the questionnaire. Again the sampling times were restricted to days with good weather in order that all respondents would view the landscape under similar climatic conditions. Three hundred forty-five mail-back questionnaires were passed out and one hundred eighteen were returned representing a 35 per cent return. All the questionnaires were used in the final analysis.

The resource management officials were selected on the basis of their professional familiarity with the study area and its problems. The four officials selected were; a land use officer, superintendent of forestry, a fisheries biologist, and a wildlife biologist. Each official was interviewed on the basis of a structured questionnaire (Appendix IV). This interview was then followed up by an informal discussion session concentrating on various aspects of the study. The choice of these four officials

served two purposes; first they represented a well informed sector of the general public and their responses could be used for comparative purposes. Second, their professional opinion on environmental matters added a crucial dimension to the land use problems and possible solutions.

THE QUESTIONNAIRE DESIGN

The questionnaires were constructed specifically for the study area using the following major guidelines. First, the sequence of questions was from the general to the specific to avoid suggesting any responses or problems. Second, open-ended questions were used to a great degree to obtain responses that the author may not have considered important or existent. Finally, where practical, the exact wording of questions in all four questionnaires was used in order to obtain some measure of comparative study. The questionnaire administered to the residents of the study area was the most extensive, and the other questionnaires used appropriate parts from this "master." The main reason for this deviation was that it could not be assumed that all the tourists and recreationists were familiar with the area, its development potential, and land use conflict. As a result certain sections of the "master" were left out, and parts of other sections were either reworded or added to as required.

The "master" questionnaire contained four sections;

general socio-economic data, landscape perception and problems, attitudes and perceived solutions, and the perception of alternatives and attitudes towards future development. Socio-economic data were gathered on; length of residence, occupation, sex, education, age, and income. Most of these variables were cross-tabulated with various responses to explore any possible relationships.

The people's perception of the landscape and its problems were assessed primarily by rating the attractiveness of the landscape, listing some possible improvements, and determining the major advantages and disadvantages of the study area. The disadvantages were interpreted as possible problems in the area and served as a general ranking in determining the seriousness of surface mining or other damages.

The next section of the questionnaire examined the problems directly related to the surface mining operation and the perceived solutions suggested to help curb the situation. These questions were of a more specific nature and tried to determine the most crucial problems perceived, the seriousness of the problems, and the evaluation of the benefits derived in the light of the problems suffered. Reclamation was offered as a possible solution to curb some of the environmental problems incurred, and

attitudes were recorded concerning various reclamation issues. Respondents were also asked to list recommendations to rectify a possible problem situation if environmental damage continued and no reclamation was carried out.

The final section was designed to obtain information on perceived alternatives, land use compatibility, and future development. This section provided an indication on how people viewed developments as possible contributions to a more diversified economic base. It also provided some insight into the reasons why people felt that certain land uses, such as mining and recreation, would or would not be compatible in the same general area.

The tourist and recreational questionnaires were almost identical, differing by only two additional questions inserted into the latter to determine recreational activity. The questionnaire design was copied from the "master" but the section on attitudes and perceived solutions, concerning surface mining implications, was deleted. Also only those people who had seen a surface mining operation in the study area, were asked to comment on the type of perceived problems, seriousness and benefits derived. The socio-economic data gathered were much the same.

The structured questionnaire administered to the management officials focused on the particular section

of the "master" dealing with perceived problems and solutions related to coal mining. The informal discussion was equally valuable in providing technical information on the various environmental problems and the resulting land use conflicts.

SOME CONSIDERATIONS AND LIMITATIONS

In this study the perceptions and attitudes have been assessed on the basis of a structured questionnaire. However, there have been several perception studies carried out in geography that have utilized a variety of other data gathering techniques or tests. Most of these techniques are usually administered in conjunction with some type of questionnaire form. For example, Sonnenfeld (1967) used photo-slides to obtain responses on preference and agreement of environmental characteristics. Saarinen (1966) applied the thematic apperception test to farmers on the Great Plains. Other tests such as the Rosenzweig picture-frustration test and sentence completion tests, have been adapted to geographic perception studies (Barker and Burton, 1969). Most of these tests are reputed to give deeper insight into certain held attitudes or perceptions than a conventional questionnaire alone.

In the questionnaire many open-ended questions are used. This was preferable because the respondent's

perceptions or opinions are not influenced by prior suggestion. The major disadvantage of this approach is in the classification of responses. The replies must first be analyzed to determine the major categories of classification. This procedure is not only time consuming but may produce a great number of individual categories. The alternative would be to provide the respondent with a limited number of choices. In the study both forms of questions are used but in view of the wide range of possible responses the open-ended questions were implemented despite their computational disadvantages.

The responses to the mail-back questionnaire posed some minor discrepancies. Although the tourists were given explicit instructions to first proceed through the area and then answer the questions, it is doubtful if these instructions were followed by everyone. There was some observed tendency for the respondent to look through the questionnaire, and then answer the questions. Second, the return on the mail-backs was less than 40 per cent despite the provision of a stamped self-addressed envelope. However, the non-response was not assumed as a significant factor that would bias the derived conclusions. The number of questionnaires administered to the "local" and "visitor" groups of the public was greatly dependent on the time available. To insure that at least two hundred

"local" interviews were conducted, it was necessary to hire and train an assistant to conduct approximately one hundred interviews. This allowed the author to concentrate on sampling the "visitor" and "resource management" groups.

ORGANIZATION

The remaining chapters of the study focus on the actual research findings as conducted under the procedures previously outlined. The impact of past, present, and future coal mining land use is examined in Chapter IV. The next two chapters deal with the perceptions and attitudes held by the general public (locals and visitors) towards the landscape, its use and development. Comparison of group responses and possible applications of study findings are discussed in the concluding chapter.

CHAPTER IV

LAND USE IN THE STUDY AREA

HISTORIC LAND USE

In 1792 Peter Fidler became the first white man to travel through the Crowsnest Pass. He was followed by Father Jean de Smet in 1845. However, it was not until the third man, Michael Phillips, travelled through in 1873, that the Crowsnest Pass was said to be fully explored. Phillips, who was an agent for the Hudson Bay Company, was struck by the ease with which the continental divide could be crossed at this point. Looking for gold, Phillips was disappointed at finding numerous coal out-croppings in the area. At the time of these explorations, the Northwest Territories and southeastern British Columbia were beginning to experience the gold rush. No gold was found in the Pass area although a legend did develop revealing the story of a lost gold mine (Riley, Rose, Dempsey, 1968). At the end of the last century the Pass had become a well-travelled route having its economy based on construction, gambling, cattle driving, and rustling (Cousins, 1952, p. 41).

Coal Mining

In 1882 coal was found in the Alberta Pass but resource and settlement growth did not flourish until the construction of the railway in 1897. The railway increased

the importance of the Pass as a communications route and allowed the coal companies better access to major coal markets. In this early period there were two main markets, steaming coal for the railway locomotives and coking coal for the steel smelters in British Columbia and Montana. In order to house the workers various small communities were established. Several of these town sites began to grow adjacent to the coal workings and along the main transportation route through the Crowsnest Pass. In the span of nine years (1898-1907), seven small communities were established in the Pass. Frank was considered the commercial center and the first hotels, businesses, and churches were located there. However, this early development was ended abruptly by the Frank Slide disaster in 1903 and the subsequent government ruling that the town be relocated westward.* This resulted in the gradual development of other communities at the expense of Frank.

The coal-initiated economic boom era lasted from about 1900 to 1911. Several smelters, a cement plant, limeworks, brickyard, and a brewery were built. The optimistic attitude of the period was well expressed by

*On April 29, 1903, ninety million tons of limestone and shale broke away from the top of Turtle Mountain. The rock cascaded over the valley floor, destroying two ranches, the entire plant of the local coal company and part of the town of Frank. The holocaust took the lives of seventy persons (Anderson, 1968).

the slogan of the newly incorporated town of Blairmore, ". . . The El Dorado of the Golden West" (Cousins, 1952, p. 64). This wave of prosperity was short-lived and most of these enterprises became defunct after one or two years. One of the smelters worked for only one day before closing down; the brewery was never opened.

Insecurity and hardships were characteristic of the mining communities in the Pass. The first serious disaster was the previously mentioned Frank Slide in 1903. Within ten years of the slide, the area experienced its first economic slump, when the coal operations at Lil and Passburg failed. By 1915 the towns of Lil and Passburg were abandoned. The first World War primed the coal economy sufficiently to put people back to work. Coal output and employment remained somewhat stable through the fairly prosperous mid-twenties. With the thirties came the depression and widespread unemployment; only a second war ten years later brought economic prosperity back to the area.

During these war years the demand for coal rose sharply and the Pass enjoyed a period of relative prosperity, with no serious mine disasters. By the mid-fifties, however, the Canadian Pacific Railway, the area's primary steaming coal consumer, had completed the transition from

coal to diesel locomotion.^{*} The railroads' conversion to diesel coupled with the development of natural gas fields drastically reduced the market for steam coal. Coal production reached a low during the mid-sixties as the number of operating mines fell from seven in 1950 to three in 1965 (Department of Mines and Minerals, 1950-1965). Figure 5 shows the coal employment and production figures since 1905.

Other Land Uses

In the early years of the coal era, lumbering was an industry which rivalled coal in the scale of operations. The industry received a major impetus from the construction of the railway, and a large mill was built at Blairmore to supply ties to the railway. By 1905 there was a mill at Coleman and two in Blairmore. However, the Coleman plant lost its primary source of supply as a result of forest fires in 1910. The two companies operating in Blairmore were able to continue operations until the 1920s at which time both shut down for lack of supply.

As mentioned earlier, several companies were formed to exploit the non-metallic mineral resources of the area. Brickmaking and cement plants were established in Blairmore

^{*} In 1945, 1950, and 1955 the average coal production was 1.7 million tons and an average of 1.2 million tons was purchased by the railway. However, in 1960 production was down to .5 million tons and the main sales were to Japan (.22 million tons) and British Columbia (.13 million tons). No sales were made to the railway. (Extrapolated from the Department of Mines and Minerals, 1945-1960).

COAL PRODUCTION AND EMPLOYMENT

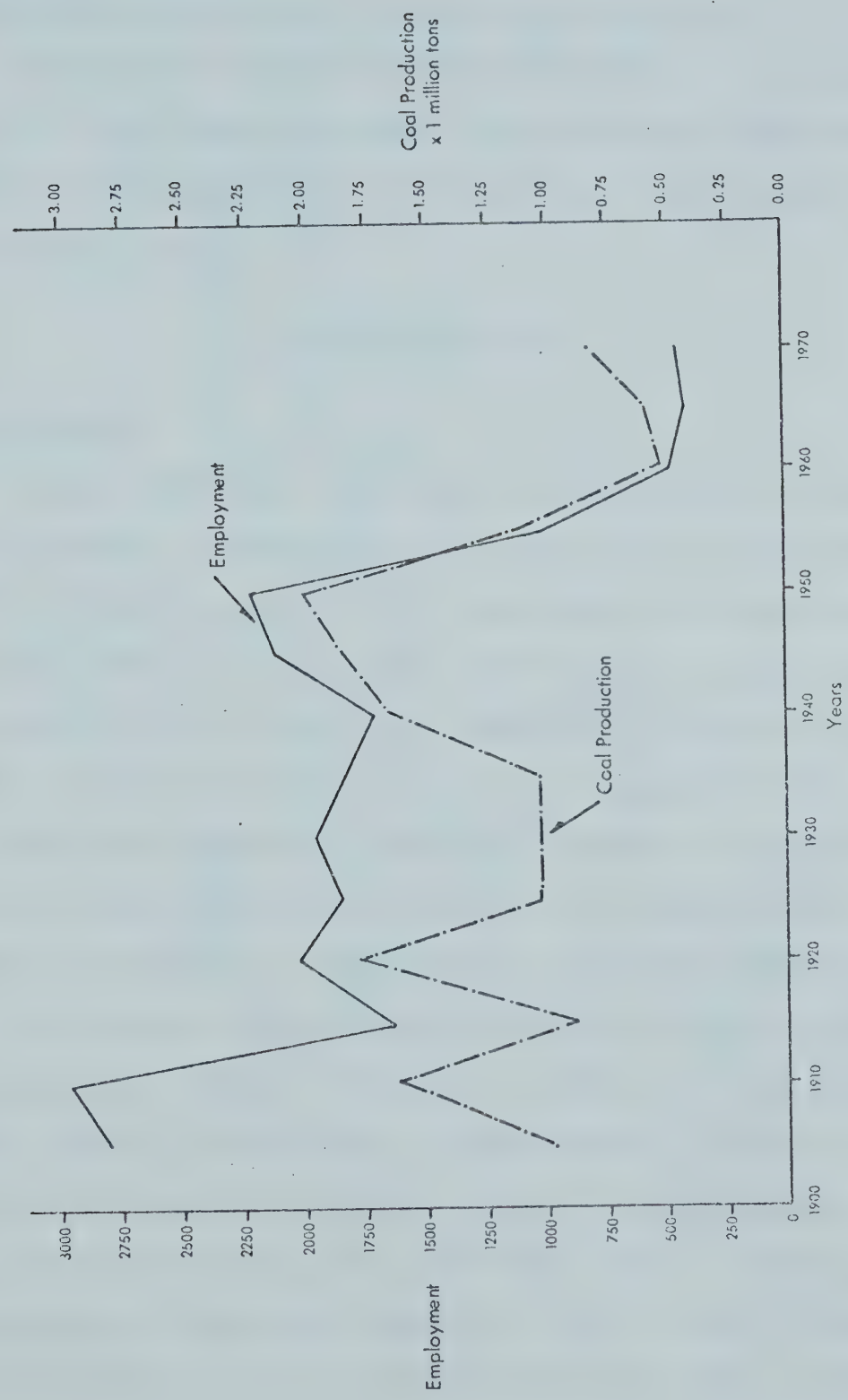


Figure 5

Source: Department of Mines and Minerals, 1905-1970

and Frank. However, during the depression most of these industries were forced to shut down permanently.

Very little agriculture use was made of the region due to a short growing season and undulating topography. In future reference the term, land use, will exclude agricultural use.

CURRENT LAND USE

Coal Mining

Since 1966 there has been an improvement in the coal industry. Production has risen from 620,962 tons in 1967 to 870,685 tons in 1971 (Department of Mines and Minerals, 1971, p. 14). This improvement in the coal industry is mainly due to the sales of coking coal to Japan. Under the terms of a contract signed in 1967, the main coal company in the area, Coleman Collieries Limited, would provide 13.3 million long tons of coal to Japan in a period of fifteen years (Christmas, 1969, p. 3).

At present three mines are being operated in the study area by Coleman Collieries. (Fig. 6.) The underground mine of Vicary Creek, approximately fifteen miles north of Coleman is the main source of coal supply. In 1971, 550,528 tons of coal were taken out of the mine (Department of Mines and Minerals, 1971, p. 20). The other two mines; one at Vicary Creek, the other on Tent Mountain, about eleven miles southwest of Coleman, are

MAJOR COAL MINES AND LEASES

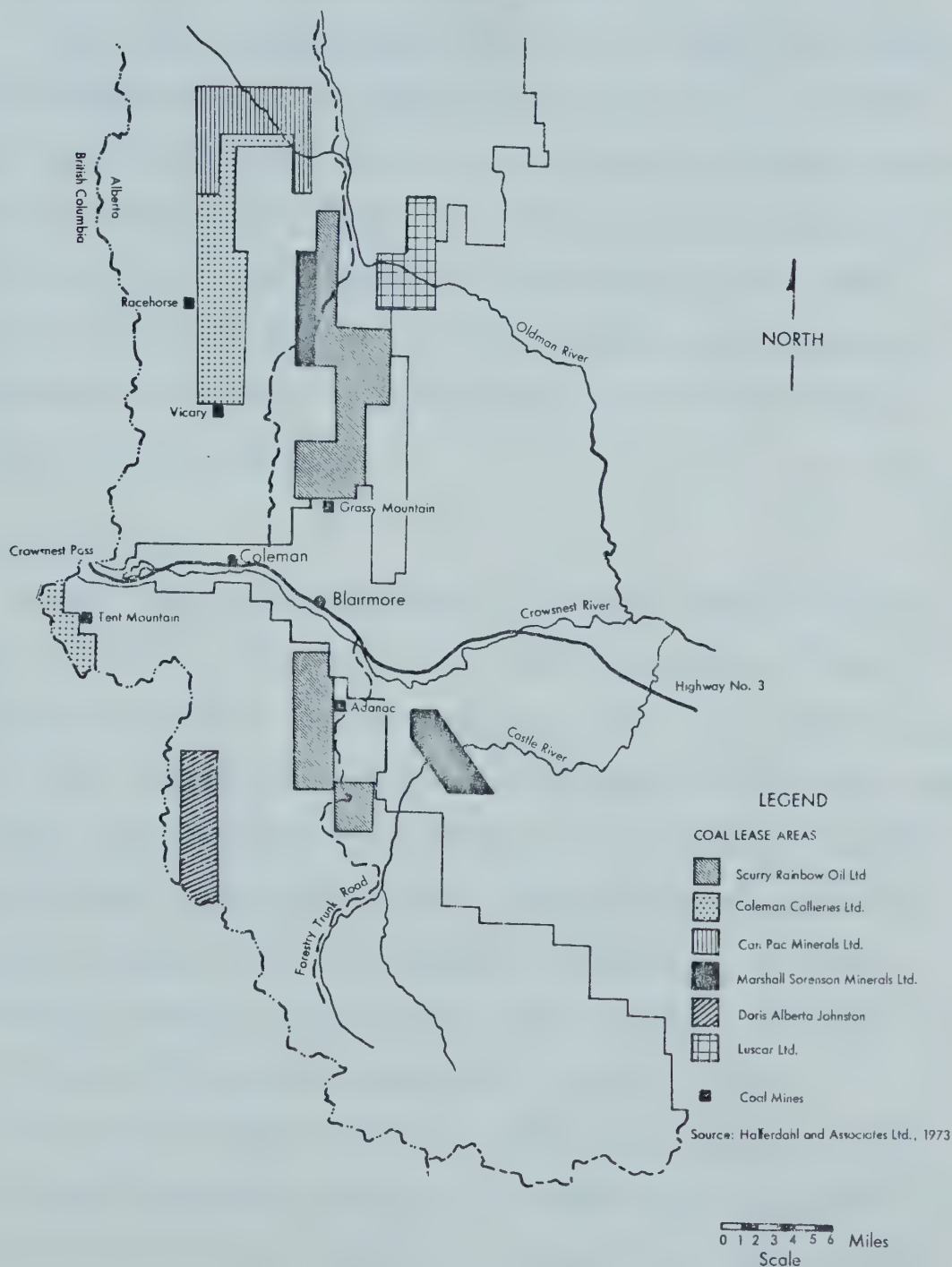


Figure 6

both strip mines. They produced 320,157 tons of coal in 1971, approximately 40 per cent of the total supply (Department of Mines and Minerals, 1971, p. 20).

Other coal mining activities in the study area have been confined mainly to exploration operations. Several coal companies have taken out coal leases and bought holdings of former mines (Fig. 6). There is much speculation that new and old mines may be in operation in the near future. The implications of these current coal mining developments on other possible land uses will be considered in a later section.

Other Land Uses

Since 1960 there has been a limited amount of industrial activity in the area. In 1961 a natural gas processing plant and a sulphur recovery plant were established at Sentinel, approximately five miles west of Coleman. The two plants presently employ about thirty people. Another major industry, Phillips Cable, a manufacturing plant for telephone cables, was established in 1966 near Sentinel. The company employs approximately 130 people. (Oldman River Regional Planning Commission, 1969, p. 134.)

The previously mentioned Summit Lime Works is the only company presently engaged in quarrying in the Pass and has been quarrying limestone since 1903. The markets for the lime and limestone produced by the plant are almost entirely outside the Crowsnest Pass although a very small

percentage is sold to Coleman Collieries. In 1968 the company employed thirty-three workers and plans were to keep this level constant. (O.R.R.P.C., 1969, p. 130.)

One other major industry deserves mention. Between 1951 and 1967 the value of timber cut in the Crowsnest Forest Reserve fluctuated around the million dollar mark per year. However, since 1961 the importance of the timber industry relative to the coal industry has diminished. In 1961 the value of timber produced was 42.8 per cent of the value of coal produced, but by 1966 timber production decreased and was valued at only 20.1 per cent compared to coal production value (O.R.R.P.C., 1969, p. 72).

In terms of industrial structure the economy is heavily reliant upon the mining industry. According to a 1968 survey (Systems Research, Inc., 1968) close to one-third (32.4 per cent) of the labor force is engaged in the mining and quarrying industry. Another 19.9 per cent are involved in manufacturing, almost all being employed by either the cable or gas processing plants. Other industries such as construction, forestry, and agriculture account for only 4.5 per cent of the labor force. Support or service industries, in total, employ 43.2 per cent of the labor force. This is split up with community, business, and personal service having 18.5 per cent, trade 11.3 per cent, transport and communications 6.8 per cent, and others 6.5 per cent.

Tourism and Recreation

The study area offers vast opportunity for both tourist and recreational activity. Recreational activity is mainly confined to the Forest Reserve area that is cut into a north and south segment by Provincial Highway Number 3 (see map in Fig. 4). Tourist activity is confined mainly to an east-west orientation along the provincial thoroughfare. However, it is quite possible that tourists and recreationists may be in both the Forest Reserve portion of the study area.

Access to the study area located in the Forest Reserve is provided by two forestry roads, one running north and the other southward (see map in Fig. 2). The Kananaskis Road runs northward from Coleman, through the Crowsnest Forest Reserve, and connects to Trans-Canada Highway Number 1 some fifty-six miles west of Calgary. The other forestry road starts at Hillcrest and runs southward terminating some two miles short of the Waterton Lakes National Park Boundary. Along the route the observer is surrounded with beautiful landscape scenery and various points of interest (Plate 1).^{*} The Alberta Forest Service has erected picnic and camping facilities along the north-south route, in the study area (see Fig, 4). There are

^{*}All photographs were taken during the summer months June-August, 1972.



PLATE 1. Table Mountain, elevation 7315' overlooking Beaver Mines Recreational Area (Figure 4).



PLATE 2. Castle River Falls running through Castle Falls Recreational Area (Figure 4).

eight first-class developed recreational areas that cater to picnicking, tenting, and provide access for trailer units. In total these fully developed recreational areas can accommodate 58 trailer units, 110 tents, and 290 picnickers. In the summer months of July and August 1972, these facilities were used to capacity. Complementing these areas are a number of roadside tables and other undeveloped recreational sites. A majority of the recreational areas are located near lakes or small streams that are usually stocked with fish. This allows the recreationist to boat and fish as well as camp. Sometimes a hike is required in order to fish in the nearby mountain lakes, but the hike is generally a rewarding one both esthetically and in the catch. Other areas have taken advantage of scenic waterfalls to capture the visitor's interest (Plate 2).

Fishing in the Crowsnest Forest Reserve Area is a recreational feature enjoyed by many. A recent survey of Alberta's hunting and fishing resources estimated that the Forest Reserve and surrounding area supported 108,259 resident and 1,601 non-resident angler days in 1969 (Miller, 1971, p. 34).^{*} This total of 109,860

^{*}An angler or hunter day is defined as a whole or any part of a day spent in sport fishing or hunting activity.

angler days ranked second highest for all watershed basin areas in the province.

The study area also provides the habitat of common big game species such as elk, moose, mule, deer, and Rocky Mountain sheep and goats. High regard is given to the area in its ability to support such species and an animal census revealed that there are approximately 600 elk, 850 moose, 550 deer, 412 sheep, and 12 goats. (Information obtained from Forestry Files in Blairmore, Alberta.) The defined wildlife region, of which the Crowsnest Forest Reserve is a major part, generated 84,374 hunter days in 1961,^{*} (Miller, 1971, p. 29).

If travel volume is accepted to reflect use, then in the last few years the Crowsnest Forest has shown a tremendous increase in recreational use. Figures tabulated from issuance of travel permits showed that travel within the Forest in 1964 amounted

^{*}The watershed basin and wildlife regions referred to above do not exactly coincide with the study area. The statistics quoted for the watershed basin area would be a close estimation since the study area and watershed basin area are almost identical. The figures quoted on animal population in the study area are also good approximations because the wildlife management unit numbers 5402 and 5400 are almost identical to the study area boundaries. However, the statistics for hunter days in the wildlife region would be an over estimation when applied to the study area, because the wildlife region takes in a much greater area.

to 76,892 people. Since that time only sporadic checking at campgrounds and roadside points as well as observational information has been used to estimate travel volume. In 1970 travel estimates within the Forest area have increased to 237,909 people (Longworth, 1970, p. 2). This increase is not surprising. In the past, use of the Forest was confined primarily to the period May to November in each year with very little winter use. Now, with the advent of snow vehicles and the trend towards skiing and other winter activities, the Forest is utilized for recreation on a year round basis. For example, the West Castle Ski Resort on the eastern slopes of Gravenstafel Ridge (see Fig, 4), had approximately 22,610 visitors in 1970 (Longworth, 1970, p. 2). This trend towards year round use of the Forest Reserve has prompted Longworth to suggest, "Recreation has become the prime use of the Forest and it is predicted that by 1975 this will result in an increase of travellers to 469,000 per year" (1972, p. 3).

The opening of the Rogers Pass highway in 1962 significantly reduced the flow of traffic through the study area. However, there is still a considerable number of visitors who drive through the Pass. Unfortunately, there appears to be little economic return from tourist activity in this, perhaps one of the most interesting and scenic thoroughfares. This study

explores the nature of tourist activity and possible reasons for this particular pattern. By combining the responses from the tourist questionnaires and the author's own observations, possible developments are suggested to increase the economic return from tourist activity.

IMPLICATIONS OF LAND USE

Mining for coal has been the major activity in the Pass area for the last century. This activity has brought with it at different times both prosperity and poverty. Furthermore, coal mining has had a devastating impact on the physical environment, that directly or indirectly influences every person living in or visiting the study area. Some of these aspects will now be covered in greater detail.

Socio-Economic Implications

One of the most prominent aspects of the area's history is the great economic fluctuations it has experienced. Changes in economic circumstances, directly linked to the coal economy, resulted in the outward and inward migration of fairly large numbers of people within relatively brief spans of time. These migrations were often gross enough to change the relative size, as well as the composition, of the towns. Consequently, the main

stream of community life in various towns has been occupied by differing groups which have supplanted each other over the years. Many people who were once active in a community are now isolated and unknown, again not so much through age as through the dissolution of their community group.

In seventy years of chaotic existence the communities, institutions, social movements, and individual careers have flourished and floundered in time with the economy. Today the towns and villages of the Pass,

. comprise a loosely organized group of sub-societies which are based on informal neighborhood associations, nationality, extended families, previously intact communities, occupational groups, past and present political organizations, and other groups.
(Department of Youth, 1967, p. 17.)

The separate communities of the Pass are characterized in varying degrees by a lack of shared local consciousness. This present situation is the result of repeated disruptions which have broken the continuity of the area's social life, and hence, prevented the crystallization of a shared local effort. This has made the Pass Area somewhat unlike most other areas of the province.

Impact on the Physical Environment

The impact of coal mining on the physical environment of the study area is difficult to assess because different people and groups have various attitudes and

opinions on the subject. However, there is a need to establish some basis of evaluation for reference or comparative purposes. To obtain this basis of evaluation the study relies heavily on the opinions and expressed attitudes of resource management officials. These opinions and attitudes are supplemented by visual evidence researched by the author, prepared reports, and submitted briefs presented at public hearings concerning surface mining in the study area. The design of this section is not aimed at extensively covering all the related issues, but rather to give some indication of the type and magnitude of impact.

The most severe damage done by coal mining has been in the Crowsnest Pass area, both as far as abandoned areas and areas presently being worked. . . . (Alberta Land Preservation Society, 1969, p. 4.)^{*}

Since most of the Pass communities were established adjacent to mine workings, both industrial and residential development competed for the limited land area of the valley floor. Because of this indiscriminate mixture of land uses there has been a marked deterioration of the residential environment attributable to the presence of abandoned and presently active coal workings. There are very few urban communities in the Pass that do not suffer from some form of coal blight. For example, the town of Blairmore has several huge abandoned coal

^{*}Since several references are made to the brief presented by the Alberta Land Preservation Society the Abbreviations A.L.P.S. will be used.

piles and machinery sheds overlooking the downtown area (Plate 3). These abandoned workings make sharp contrast with the scenic landscape across the valley (Plate 4). The town of Coleman possibly suffers the greatest from present coal mining activity. In 1969 a coal washing and handling plant was erected at Coleman. The plant was situated close to the downtown commercial sector of the community resulting in coal dust pollution of the downtown area. Many of the buildings have become visually dirtied and some have been subsequently abandoned (Plate 5). Adjacent to the processing plant additional coal dust is generated from active coal workings (Plate 6). Large trucks are used to haul coal to the plant and contribute both noise and dust pollution to a large portion of the Pass area.

The abandoned and presently active coal workings detract from the natural surroundings and act as nuisance factors in the form of air and noise pollution. Because of these coal factors and subsequent abandonment of buildings, the urban area of the Pass takes on a visually unattractive appearance to the observer. A survey was carried out in 1970 to gain an impression of residential development throughout the Pass. The results of the survey revealed that over 43 per cent of the housing stock was judged to be visually "poor." Second, the "poor" housing was distributed throughout the entire



PLATE 3. Abandoned coal piles and machinery sheds immediately north of the Blairmore downtown area. No attempt has been made to clean up the abandoned workings.



Plate 4. Immediately to the south of the Blairmore townsite is a scenic landscape that provides sharp contrast to the opposite side of the valley.



PLATE 5. Downtown commercial area of Coleman. Many of the buildings have become soiled by the coal dust emitted from the coal cleaning plant at the end of the street. The large stone building in the right corner of the photo has been abandoned.



PLATE 6. A closer view of the coal cleaning plant in Coleman. The plant contributes both noise and dust pollution to nearby residential areas.

area (O.R.R.P.C., 1970, p. 96).

The urban physical environment suffers from coal blight associated mainly with the transportation and processing phases of the mining operation. The impact of coal mining on the rural environment has produced widespread and severe effects via the coal exploration and extraction phases.

The abandoned strip mine at Grassy Mountain about six miles north of Blairmore and four miles east of the Kananaskis Road is shown on Plate 7.[★] Between 1947 and 1958 the West Canadian Collieries was reported to have mined about 2,750,000 tons of coal from the strip^{★★} (A.L.P.S., 1969, p. 4). Several road networks and deep gouges were carved through the landscape giving it the desolate appearance of a moonscape. As one observer commented, ". . . and here is the beautiful Grassy Mountain completely desecrated, great huge black seams and holes exposed" (Davidson, 1971, p. 192). Besides this undesirable visual impact, erosion carries both sediment and coal fines into two nearby streams. Both Blairmore Creek and Gold Creek are at times polluted resulting in a detrimental impact on fish life and urban water quality (A.L.P.S., 1969, p. 25). Similar circumstances surround

[★]For exact mine location consult Figure 6.

^{★★}West Canadian Collieries sold their coal holdings Scurry-Rainbow Oil, Ltd., in 1966.



PLATE 7. Grassy Mountain strip mine. No attempt has been made to reclaim the landscape and it remains visually unattractive.

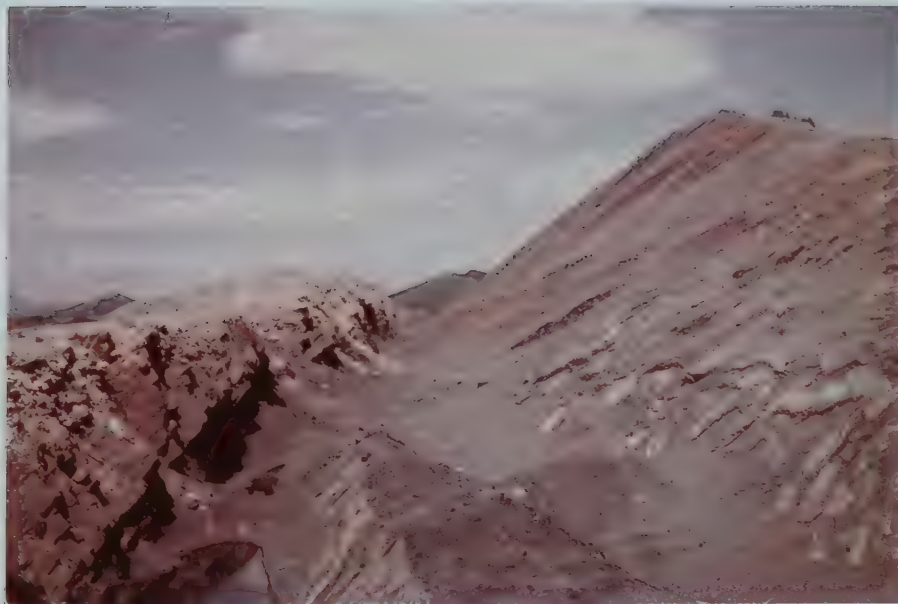


PLATE 8. Adanac strip mine. Fifteen years of abandonment shows no natural revegetation. The erosion of the steep face slope makes vegetation impossible but contributes to stream sedimentation.

other abandoned strip mines. The Adanac strip mine, some twelve miles south of Hillcrest, has not been reclaimed in any way and is at the mercy of erosional agents (Plate 8).

The Tent Mountain strip mine, situated on the Alberta-British Columbia border, is presently in operation (Plate 9). In the last ten years approximately two and one-half million tons of coal have been strip mined by Coleman Collieries from an area of 300 acres (A.L.P.S., 1969, p. 5). During spring run-off much of the stripped material is transported as sediment by Glacier Creek, downstream and ends up in Crowsnest Lake. The lake remains muddy most of the summer and is believed to act as a settling basin. The strip mine at Vicary Creek approximately fifteen miles north of Coleman, has received much the same criticism. One observer stated, "I lived every summer for the last fifteen years for one to two months at the mouth of Daisy which is approximately three-quarters of a mile from the mouth of Vicary, and I can attest to you that Vicary never runs clean in the summertime" (Davidson, 1971, p. 191).

Underground mines represent an additional problem in the form of effluent emissions. Most of the abandoned underground mines, and the presently worked Vicary Creek mine, release dilute sulphuric acid with a high iron content that collects on streambeds. During 1971-72 a



PLATE 9. Tent Mountain strip mine is presently operated by Coleman Collieries. The strip mine is on top of the mountain and revegetation will be difficult at this high elevation.

preliminary investigation of coal mine effluents and their effects on water quality was conducted in the study area. The water chemistry of six major effluents was treated as they appeared at both abandoned and operational coal mine tunnels. The report concluded that,

. . . the effluents in the Crowsnest Pass are a very serious problem insofar as they affect water quality and stream benthos. Remedial measures are obviously warranted. (Graveland, Radford, 1972, p. 22)

The coal company has come under repeated charges of violating legislation and causing unreclaimable environmental damage. The company's reaction to these charges seems to be one of complacency reflected in the statement,

Being the principal employer in the region makes it very important that the Company's activities continue and that an economic burden imposed by exaggerated ecological enthusiasm should not be allowed to cripple the operation. (Jamieson, 1971, p. 126.)

A visual survey revealed that very few of the strip mines or abandoned coal piles have even signs of attempted reclamation. There is some doubt if certain areas can be reclaimed to any degree due to economic and technological restraints. As one concerned citizen stated:

All my life I have lived near strip mines, Grassy Mountain, Tent Mountain, Adanac, Vicary, and some smaller operations and I can realize the futility of restoring the disturbed land to something like it was originally in aesthetic value as well as production. (Michalsky, 1971, p. 187.)

Resource Management Opinions

Two forestry officials, a wildlife and fisheries biologist were asked to give their opinions and attitudes concerning strip mining in the study area. The four officials were selected because they were involved in assessing strip mining damage on the area's environment.

All four agreed that strip mining did cause damage to the environment but the severity of the damage depended upon the specific geographic location. However, all rated the damage for the whole area as of "major concern" and becoming "very serious." When asked to list the damages they felt were most serious, three replied that erosion leading to water quality alteration was most severe. The other official felt that landscape degradation and subsequent loss of aesthetic value was important. The wildlife biologist pointed out that strip mining operations did overlap with areas that served as wildlife habitat. However, since no impact study has to date been conducted, the seriousness of the situation was difficult to evaluate.

When the officials were asked to compare the benefits derived with the damages suffered, three felt that the damages far exceeded any benefits. One official commented that if the two strip mines were shut down the miners would be assimilated in the underground operation and little economic impact would be felt. The remaining

official commented that the damages could be controlled or minimized by forcing the company, through legislation, to post a reclamation bond. By this procedure the land would be reclaimed and benefits would be collected from the coal operation.

All felt that reclamation to date has been vastly inadequate. Two commented that only a "token" effort at reclamation has so far been made. They all felt that reclamation was necessary and the company should be held responsible to carry it out. However, it was also pointed out that certain strip mine areas were impossible to reclaim from an economic and technologic standpoint. In certain cases, the stripped slopes are too steep and revegetation is impossible. Because the strip operations are conducted in mountainous areas it is virtually impossible to restore the area to its original state. Reclamation in these areas, can at best, only minimize post operational damage.

When asked if present legislation was adequate to deal with strip mining problems two officials regarded it as adequate, two others held the opposite view. The two officials who responded in the affirmative, commented that the legislation was adequate but the enforcement of this legislation was difficult. One official commented that if the existing legislation was strictly enforced both strip mining operations in the area would

be shut down. The other two officials had several additions to make to the existing legislation. (See Appendix V.) Three main recommendations were put forth:

1. The mining company should submit an operation and reclamation plan for both summer and winter operations.

2. The company should have to post a reclamation bond to insure that reclamation be carried out or else forfeit the bond.

3. Certain areas should be zoned for various uses where surface mining is not allowed due to reclamation difficulties and aesthetic value damages.

FUTURE LAND USE POTENTIAL

Coal Mining

Since the late sixties new, larger, and longer term coal contracts with Japanese steel have been announced in the Canadian financial pages. At present the major coal company in the Pass, Coleman Collieries Limited, enjoys a fifteen-year coal contract with Japan which expires in 1982. This security of a long term contract for coking coal insures the Pass of another ten years of strip and underground coal operations.

As was mentioned previously, several other companies are contemplating coal operations in the area. These operations depend heavily on coal contracts from the

Japanese steel industry. Indications are that this steel industry will grow over 44 per cent between 1969-1975 (Financial Post, August 23, 1969, p. 4). The demand for coal and, in particular, the trend towards Canadian supply will closely follow the changes in Japanese steel production and output. Also there are projected strong demands for coal as a thermal electric power fuel (Financial Post, July 20, 1968, p. 3). Eastern markets, particularly Ontario and Quebec, have increased the potential of coal sales. Between 1957 and the present day thermal power generation using coal has increased from 13 per cent to over 50 per cent of the total Ontario power generation. At present this is only a potential market since 99.9 per cent of the Pass coal is shipped to Japan (Department of Mines and Minerals, 1971, p. 15).

The expanding market for coal sales to Japan and other areas supply the potential for new and extended long-term coal contracts. The Crowsnest Pass area is probably in an "upswing" as far as coal mining is concerned. Speculation has it that at least one other coal company will start production in the near future.*

* Speculation based on interview held with Mr. Rush-ton of Canadian Pacific Industries, in Calgary, August, 1971.

Industrial Development

The development of new industries in the Crowsnest Pass area can only be speculative. However, the establishment of previous industries in the area seems to indicate that other factors, rather than geographic, were instrumental in the location decision. For example, the two gas and sulphur plants were established in the Pass primarily because of the construction of a pipeline through the area. Similarly, the establishment of the Phillips Cables plant was mainly due to the designation of the area by the Federal Government. The designation offered cash grants to manufacturing and processing industries to locate within the designated areas.* The cable plant could have been established almost anywhere in Western Canada but was attracted to the area because of the monetary inducements of the Designated Area Program.

From this information it would appear that industrial potential in the study area is not great unless the area is redesignated. Other factors such as coal blight and geographic isolation of the area do not give favorable incentive to future industrial potential.

* The Pass area was designated as a depressed area because it was characterized by high and chronic unemployment and low family incomes (Department of Industry, 1965, p. 1).

Tourism and Recreation

Tourist and recreational development appears to offer a great potential in the study area. As already mentioned, the Forest Reserve portion of the study area has experienced a tremendous increase in recreational use. It has also been estimated that by 1975 the area will have 469,000 visitors per year (Longworth, 1972, p. 3). To meet this demand existing and new recreational areas will have to be developed. Since the Forest Reserve is situated between two National Park complexes it is important that the area receives major consideration for recreational development. The further improvement of the Kananaskis Road would allow access from the Trans-Canada Highway to Waterton Lakes National Parks. Thus a visitor at Waterton Lakes, wanting to visit Banff and Jasper, could drive in the midst of beautiful mountain scenery the entire way.

One development aspect that has almost been totally neglected is the evident tourist potential along the east-west Pass route. Along and within a few miles of this major thoroughfare exist natural and man-made points of interest that would kindle the interest of many tourists.

Historic mining towns such as Lil or the stone remains of Passburg could be developed into major tourist attractions. Other features such as "The Cave" are used very little. George M. Dawson describes it

as:

The spring issues from a large, overhung grotto in the face of the limestone cliff; the water welling up from the interior of the grotto, and filling a deep, clear pool at its mouth (1886, pp. 70B, 71B).

At Frank are found two springs, a sulphur spring and a freshwater spring. In the past a "sanatorium," using the sulphur spring water as a healing fluid in "baths," was erected at the sites. At present neither the sulphur spring nor the freshwater spring are being used for recreational purposes. Along the thoroughfare are a number of scenic waterfalls and lakes. In particular, Crowsnest Lake (Plate 10) appears to be suited for recreational developments, if strip mining damage is controlled.

Perhaps one of the most outstanding tourist features in the area is the Frank Slide. Cousins states:

On April 29, 1903, shortly after four o'clock in the morning, a huge wedge of limestone slipped from the face of Turtle Mountain, struck the bulging lower part of the peak, smashed into the valley and drove up the other side for two miles (1952, p. 135).

The Pass route has been built on top of the debris and a historic marker has been erected at the site. This particular location was chosen as the sampling point for the tourist survey employed in this study.



PLATE 10. Crowsnest Lake located along Highway No. 3. The lake has received very little development as either a tourist stopping point or recreational area.

IMPLICATIONS OF FUTURE LAND USE

Considering the previous discussion it would appear that future land use potential in the study area centers around two major themes, coal mining and tourist and recreational land use. If future development follows historic patterns and coal mining continues to be the major land use, then the area will still experience familiar socio-economic and environmental problems. On the other hand, tourist and recreational use seems to offer three main advantages that affect, not only the study area, but the whole province.

1. If tourist and recreational development is adopted it could substantially contribute a more diversified and strengthened economic base within the Study Area.

2. Tourist and recreational land use would add long term economic stability and place emphasis on landscape preservation as opposed to the existing situation.

3. Since the Study Area is located in a tourist-oriented region between two National Parks it could be viewed as an alternative to the present development pressures experienced in the Parks. The development of the area could provide the tourist and recreationist with a positive alternative to the increasingly overcrowded National Parks.

The success of this proposal will greatly depend

on the type of tourist and recreational development. However, comment on this is restricted at this point until the tourist and recreational study data are examined.

Another major concern is whether coal mining and recreational development can be compatible in the same general area. As pointed out earlier coal mining has had a detrimental impact on both the urban and rural environments. If further mining is allowed there is little doubt that this damage will affect the natural basis of recreational development. As one association predicted:

Considerable supplies of coal were found in the Oldman River area, and if these deposits are to be mined in the future, and we have no reason to believe that they won't be, more and better roads will have to be built, and probably even a railroad. This would only compound the existing problem and thereby, deprive our wildlife of still another homeland, and deprive every citizen and tourist of the scenic beauty and recreational value of this remote area. (Lethbridge Fish and Game Association, 1971, p. 123).

Resource Management Opinion

The resource management officials were asked to give their opinions on possible alternatives to the coal mining land use. Two of the officials felt that the area should be made into a park. The other two indicated that tourist and recreational development should be given top priority but it was not necessary to make the area into a park.

When asked if coal mining and recreational development were compatible, three of the officials said that from their experience the two developments would not be compatible. Their reasons were based on the feeling that, at present, recreational and tourist potential is being ruined by the coal operation. The other resource management official felt that, at present, both developments were compatible because the damage was not widespread, but he voiced concern for the future. All expressed deep concern for the recreational future of the area in the light of impending additional coal mining operations.

CHAPTER V

EXPRESSED ATTITUDES AND PERCEPTIONS

OF THE LOCAL PEOPLE

In the previous chapter, past, present, and future land use in the study area was examined. Several different sources were incorporated to establish a basis for a real situation. This chapter attempts to investigate the attitudes and perceptions the local people hold towards the study area. These perceptions and attitudes may or may not concur to other expressed opinions. Nevertheless, obtaining the local people's views on the landscape, its use, and potential development can aid in evaluating and formulating various land use proposals.

SOCIO-ECONOMIC CHARACTERISTICS

Education

The great majority of the local people interviewed had some high school education. The rest of the percentages were fairly evenly distributed amongst those who had less than grade eight (11 per cent), business and technical training (8.5 per cent), and those who had some university (11.5 per cent). Table I shows the distribution of education levels.

TABLE I
EDUCATION LEVELS ATTAINED BY LOCAL RESPONDENTS^{*}

Education Level	Percentage of Respondents
Grade 8 or Less	10.0
Grades 9-12	70.0
Business College	2.0
Technical Training	6.5
Some University	6.0
Undergraduate Degree	3.0
Graduate Degree	2.5
Total	100.0

^{*}Since the total sample of people interviewed is two hundred, the number of responses for each category can be obtained by doubling the percentage value.

Occupations

More than one-third of the people interviewed were employed in some capacity by the coal mining industry. The second largest occupational group were the housewives representing 19 per cent, followed by industrial 9 per cent, and professional 8.5 per cent. Students, retired people, and the commercial sector each represented 8 per cent of the local respondents (Table II).

TABLE II
OCCUPATION OF LOCAL RESPONDENTS

Occupations Listed	Percentage of Respondents
Mining (Coal and Others)	36.0
Housewife	19.0
Industry	9.0
Professional	8.5
Student	8.0
Retired	8.0
Commercial	8.0
Other	3.5
Total	100.0

Income

Although occupation is usually considered a reliable guide to the level of income, the study also solicited income figures from the respondents (Table III). The distribution shows that a large concentration of local people were in the mid-income range (\$6001-9000). Seventeen per cent of the respondents were in the low income group, and another 15.5 per cent were in the \$9001-12000 income range. A very small per cent of the sample attained an income greater than \$15,000. For interest, the occupational groups were cross-tabulated with the income ranges.

TABLE III
INCOME LEVEL OF LOCAL RESPONDENTS*

Income Range	Percentage of Respondents
\$ 0 - 3,000	17.0
3,001 - 6,000	5.5
6,001 - 9,000	55.5
9,001 - 12,000	15.5
12,001 - 15,000	4.0
15,001	2.5
Total	100.0

*There were very few cases of non-response to the income question. In the instances where the respondent refused to comment, income range was deduced from the occupation listed.

Seventy-nine per cent of the people employed in mining listed their income range to be in the \$6,001 - 9,000 bracket. Only 3.5 per cent listed their income level to be from \$3,001 - 6,000, and 17.5 per cent stated their income range to be \$9,001 - 12,000. People employed in industry had an almost identical distribution with 75 per cent in the \$6,001 - 9,000 range and 2.5 per cent in the \$9,001 - 12,000 range. The professional and commercial sectors exclusively occupied the higher income ranges. Sixty per cent of the professional group listed their income to be over \$12,000. This was complemented by 31 per cent of the commercial sector that stated the same figure. Almost all of the students (94 per cent) and retired people

(88 per cent) listed their income range to be \$0 - 3,000. It would appear that people employed in industry and mining occupied the mid-income range while the professional and commercial groups were in the high income brackets. The majority of students and retired people were classified in the low income range.

Other Statistics

Approximately two-thirds (68 per cent) of the local respondents interviewed had lived in the study area for more than fifteen years. Another twenty-one had resided in the Pass area for six years or less. Only 11 per cent of the people interviewed had lived in the area between seven and fourteen years. The figures would seem to suggest that there has been a period of stagnation followed by a recent, but slight, influx of people into the area. However, the majority of the respondents have made the Pass their permanent home for a number of years.

The age distribution indicated that 24 per cent of the sample were under the age of thirty-one, 45 per cent were between the ages of thirty-one and forty-five, and 36 per cent were in the age group greater than forty-five. The rather high percentage in the forty-five and over category is not surprising since the area is reported to have many retired people.

Out of the total sample of respondents two-thirds

were male and approximately one-third were female. The majority of the respondents resided in single family dwellings (77 per cent), followed by 8.5 per cent living mobile homes.

A survey conducted by the Department of Youth Research Division (1967) found that the population of the Crowsnest Pass Area is significantly different from the population of the whole of Alberta in a number of ways. For example, in terms of education, the area had a high proportion of residents with less than five years of schooling, and a comparably small proportion of those with more than ten years of schooling. The distribution of occupation showed that the Pass area had a disproportionately small number of white collar occupations and an unusually large proportion of people employed in mining and industry. In terms of age, the young adult group (20 to 34 years of age) group was grossly under-represented in the Pass in contrast to the province. The area also had an unusually high proportion of single person households. Comparing these values to the reported socio-economic statistics in this study shows them to be almost identical. It appears that the Crowsnest Pass Area has changed little in the socio-economic make-up and probably remains significantly different from the provincial average.

PERCEPTIONS OF THE LANDSCAPE AND RELATED PROBLEMS

When you stay in this area you become conditioned to the environment and the people around you. You do not notice what is happening, everything is played down. (Respondent, 1972.)

People's views of the landscape depend on a variety of factors that blend to form the essence of the landscape. These factors may be natural or man-made, as Lowenthal explains, "What Americans see in landscapes, and how well they like them, depends on how landscapes are being used." (1963, p. 21.) This section tries to determine just how the local people view their surrounding landscape and related problems.

Landscape Quality, Improvements, and Problems

The responses to the question, "What are some of the things you like most about this area, things that you consider are advantages?" are illustrated in Table IV. This particular question was inserted to obtain some general indication of the most liked aspects of the study area as perceived by the respondents. Several responses from each respondent were obtained but only the first two were classified. Unfortunately, the individual responses had to be placed into broader categories and some of the detail has been lost. According to the average value almost half (41 per cent) of

TABLE IV

PERCEIVED ADVANTAGES OF THE STUDY AREA[★]

Advantage Listed	First Response	Second Response	Average
Beautiful Landscape Scenery	54.5	27.5	41.0
Obliging and Friendly People	21.5	26.5	24.0
Good Recreational Area	14.0	24.0	19.0
Peacefulness of the Area	3.0	2.0	2.5
Good Climate in Summer	2.0	2.0	2.0
Others	3.0	16.0	9.5
No Advantages	2.0	2.0	2.0
Totals	100.0	100.0	100.0

[★] Average percentage values were used to rank responses when more than one response was classified.

the respondents agreed that the area had an outstanding scenic landscape. Several references were made about "beautiful mountains and lakes." Others made comment that the landscape represented "natural beauty." The second most often mentioned advantage applied to the local people themselves. Approximately 24 per cent felt that the people in the Pass were friendly and obliging. Another one-fifth of the respondents felt that the area catered to various recreational activities and perceived this as a major advantage. Particular mention was made to such activities as camping, hiking, fishing, and hunting. Many of this group viewed the Pass area as a central core allowing quick access to the various

recreational areas. A small percentage listed the areas' climate and tranquillity as an advantage. The author is not exactly sure why 2 per cent of the respondents mentioned that they perceived the climate in summer as an advantage. The peacefulness or tranquillity was usually made in reference to the surrounding rural landscape. It was viewed as an "escape" from the urban environment. The remaining listed advantages were placed into the "other" category because no factor was mentioned more than twice. Some of the respondents in this category perceived the area as providing good job opportunities and access to major urban centers. Non-responses were also placed in the "other" category. Two per cent of the sample perceived no advantage that the study had to offer.

In order to obtain some idea of the perceived problems of the study area the respondents were asked to list aspects which they regarded as disadvantages. The first two responses were classified and an average value derived (Table V). Both in the first and second responses blight of the urban environment was listed as the major problem. In this respect most of the blight was attributed to either abandoned or active coal workings. Particular references were made to the abandoned coal piles near town sites and the presently active coal cleaning plant at Coleman. Some respondents felt that

the coal blight was to blame for the dilapidated condition of various residential and commercial sectors of the Pass. Lack of co-operation was perceived as another major disadvantage in the study area. It would appear

TABLE V

PERCEIVED DISADVANTAGES OF THE STUDY AREA

Problems Listed	First Response	Second Response	% Average
Blighted Urban Environment	29.0	32.0	30.5
Lack of Co-operation among Communities	22.5	17.5	20.0
Lack of Specialized Services	16.5	6.5	11.5
Poor Climate	14.5	10.5	12.5
Poor Shopping Facilities	3.5	0.5	2.0
No Disadvantages	3.0	3.0	3.0
Area is Isolated	2.0	4.0	3.0
Other Problems	9.0	26.0	17.5
Totals	100.0	100.0	100.0

that when the communities have to co-operate in any joint venture, conflict results. This lack of co-operation and communication could possibly be correlated with the socio-economic disruption suffered throughout the Pass history. The lack of specialized services offered by dentists, lawyers, plumbers, and others was also perceived as a disadvantage. An average of 12.5 per cent of the

respondents made some reference to the poor climate of the area. The majority of these responses confirmed that it was "windy and cold" with a good amount of snowfall. The rest of the responses were scattered and composed of a number of factors that were viewed as problems or major disadvantages. Listed under "other problems" were; nothing for young people to do, lack of job opportunities, the area is growing too fast, strip mining is ruining the area, and no response. When comparing responses of Tables IV and V it would appear that the advantages listed pertained mainly to the rural environment excluding the immediate urban environment. The listed disadvantages or perceived problems centered on the urban situation and few comments were made about the problems that may be evident in the rural environment. In this respect it would seem that strip mining was not perceived as a major problem in the light of other mentioned factors. This result is not unexpected since other studies have confirmed that people tend to list factors that they encounter most often or have personal experience with rather than other, possibly more serious problems, that are removed from the immediate environment (Saarinen and Cooke, 1970).

When asked to rate the attractiveness of the surrounding landscape a large majority (86 per cent) rated the landscape as being "very attractive." Another 10

per cent felt it was "attractive" and only 4 per cent stated that the landscape was "somewhat attractive." Some of the attractive elements in the landscape can be deduced from the responses voiced in Table IV. Mention there was made of "beautiful mountains and lakes" and "peacefulness." In order to obtain an insight into the factors that were perceived as inhibiting landscape attractiveness, the respondents were asked if it could be improved in any way. Approximately two-thirds (69 per cent) felt that landscape attractiveness could be improved and 31 per cent replied in the negative. Those people who replied in the affirmative then listed the various improvements that they regarded as necessary. Only the first response from each respondent was classified and expressed as a percentage value out of a possible 69 per cent (Table VI).

TABLE VI
IMPROVEMENTS TO ENHANCE LANDSCAPE ATTRACTIVENESS

Improvements	Percentage of Total Sample
Reclaim Coal Piles	32.0
General Clean-up of Towns	27.5
Promote Recreational Potential	3.0
Stop all Coal Mining	2.0
Reclaim Strip Mined Areas	2.0
Others	2.5
Total	69.0

Almost half of this group felt that the coal piles should either be removed completely or at least landscaped and seeded. Another large percentage (27.5 per cent) commented that a general clean-up of all the towns, their abandoned buildings, and associated coal piles would help make the landscape more attractive. Three per cent recommended that the emphasis should be placed on recreational development and coal mining restricted. This was supplemented by 4 per cent who suggested that all coal mining operations should be stopped and strip mined areas reclaimed. The majority of these listed improvements pertain almost exclusively to the urban area. At most, 7 per cent of the respondents interviewed made some mention of rural landscape improvement. A large percentage of the respondents (31 per cent) felt that the landscape attractiveness could not be improved. Unfortunately, the questionnaire did not ask these people why they felt this way. Based on the author's personal opinion it would appear that a majority of these respondents regarded the surrounding landscape as "natural" and felt that it should not be tampered with by man. This would seem to leave two major alternatives. Either the respondents perceived the urban blighted areas as part of the natural landscape or they have totally excluded it from the surrounding landscape. The latter alternative corresponds to the previously derived

observation that there appears to be a split between the urban and rural landscape, on the basis of perceived advantages and disadvantages. However, the first alternative must not be disregarded since it may be supported by subsequent findings.

SURFACE COAL MINING; PERCEIVED DAMAGES, BENEFITS, AND SOLUTIONS

This section focuses on the perceptions and attitudes held towards various factors associated with strip mining damage. It deals with more specific details such as perceived damage, seriousness of damage, and attitudes towards suggested solutions.

Strip Mining Damage

A majority (88 per cent) of the local people interviewed agreed that strip mining did inflict damage on the environment of the Crowsnest Pass Study Area. However, 11 per cent replied that there was no damage done and 1 per cent didn't know if damage did result due to this type of operation. The group that responded in the affirmative (88 per cent) were asked to state the first and second most serious damages caused by the operation. These responses were classified into general categories (Table VII). The damage perceived as being most serious was air and water pollution. One possible reason for this response is that often the water supply of

various communities is contaminated by coal fines from the strip mines. This is usually the case during spring run-off. However, it is interesting to note that surface mining does not contribute directly to air pollution in

TABLE VII
PERCEIVED DAMAGES CAUSED BY STRIP MINING

Damage	First Response	Second Response	Average
Air and Water Pollution	46.5	27.5	37.0
Destruction of Aesthetic Value	28.0	32.0	30.0
Displacement of Wildlife	4.5	14.5	9.5
Alters Watershed Character- istics	4.0	2.0	3.0
Ruins Fishing	3.0	5.0	4.0
Other Damages	2.0	7.0	4.5
Total			88.0

any significant degree. It is possible that the respondent reverted to the urban situation when replying to the question, thus making an inaccurate response. The damage perceived next most serious was the destruction of aesthetic value. Reference was usually made to the "scarred landscape" or the destruction of "beautiful mountains and scenery." The third ranked damage perceived by the respondents was the displacement of wildlife. The

feeling was that many of the strip mined areas were, at one time or another, natural habitat for various species of wildlife. The consequent stripping and accompanying noise has forced the wildlife to move elsewhere.* Other perceived damages were closely related to the first two ranked problems. Alteration of watershed characteristics referred to water quality and quantity change. Others commented that strip mining was polluting the streams, killing the fish, and consequently ruining the fishing. The "other damages" category reflected personal grievances such as; coal trucks are noisy and a nuisance on the roads, or, I can't think of a second damage.

The 11 per cent that stated no damage was caused by the strip mining operation listed three main reasons for their views. Based on the total sample 5 per cent of this group felt that the damage inflicted was accepted by the people as the price to pay for progress. Another 4 per cent replied that there were no signs of damage. The remainder of the group (2 per cent) felt that reclamation would adequately restore the damaged areas. These three given reasons would appear contrary to the initial response. What this group (11 per cent) probably meant was that there is damage but in view of other facts

*Some of the respondents commented that many of the big game species were forced to migrate to British Columbia leaving this portion of Alberta deficient.

this damage could be considered as negligible or much less important when compared to the benefits. Part of this group had a strong faith that reclamation would alleviate the damages. In view of facts this would be a faulty assumption. Another small segment felt that no "real" damage was inflicted. What was meant by "real" damage is difficult to speculate. It is evident that this group represents views opposite to those held by the resource management officials.

Seriousness and Benefits

All the respondents were asked to comment upon the seriousness of the damages caused by strip mining by selecting the appropriate category that expressed their feelings. Fifteen per cent considered the damages to be "very serious." A large percentage (60 per cent) felt that damages were "somewhat serious" and 13 per cent regarded them as "not serious." This breakdown of response corresponds favorably with previous observations. Most of the respondents acknowledge the fact that there is damage inflicted but it is not as serious as possibly other immediate concerns. The 15 per cent who consider the damages as "very serious" could be classified as conservationists, while the 13 per cent making the "not serious" response would be largely comprised of those people who felt no damage was inflicted. For comparative

purposes all the respondents were asked if the benefits from the strip operation were greater than the damages suffered. Approximately one-half (45 per cent) replied that the benefits were greater than the damages. Most of these benefits were directly related to employment or economic prosperity of the area (22 per cent of total sample). One of the phrases mentioned by a respondent that typified the group's attitude was, "economy before ecology." It is questionable if the economy derived from the strip mining operation is all that significant. In 1971 the total average number of men employed in strip mining was 33 (Department of Mines and Minerals, 1971, p. 20). If the strip mines were completely shut down the men would likely be assimilated by the underground operation without a detrimental impact on the economy. Another 11 per cent felt that under certain conditions, such as immediate reclamation, benefits would be greater. Five per cent listed other benefits and surprisingly 7 per cent refused to comment. The respondents who felt that the benefits from strip mining were not greater than the damages represented 28 per cent of the local people interviewed. This group viewed strip mining as: destroying the recreational potential of the area (10 per cent), causing damage that could not be reclaimed (12 per cent), and others (2 per cent). The destruction of landscape was cited as one of the recreational values that was lost

because of the operation. Of the remaining total percentage 24 per cent viewed benefits and damages as about equal. Another 3 per cent didn't know if benefits were greater from the operation. This lack of awareness could be attributed to the respondents who have moved into the area recently.

Reclamation

As a guide the term "reclamation" was defined and various degrees of reclamation were outlined in the questionnaire. The local people interviewed were then asked if reclamation was necessary and, if so, what kinds of reclamation they felt should be enacted. A large majority (95 per cent) agreed that reclamation was necessary. Only 3 per cent responded in the negative and 2 per cent were not aware of the need for reclamation. When asked what kind of reclamation be enacted 82 per cent felt that the land be restored to its original state. Fifteen per cent stated that it was not necessary to restore the damaged land completely but agreed that some attempt should be made to fill in the deep scar in the landscape. A minority (3 per cent) felt that no reclamation was needed. Although a large percentage of the local respondents felt that the damaged landscape should be restored to its original state, from previous discussions it is doubtful if this is feasible. This suggests that many respondents have an idealized view of reclamation

and do not perceive it in the light of economic and technological constraints. Possible reclamation demands from this group may not be practical.

Dwelling on a similar theme the people were asked if there has been adequate reclamation in the study area. Approximately two-thirds (69 per cent) claimed that there was not enough done. However, 6 per cent felt that there was adequate reclamation but 25 per cent "did not know" if it was adequate. This response could be interpreted as a lack of awareness or a feeling of complacency on the part of the local people.

A follow-up question was administered to determine whom the local people held responsible to reclaim any damages suffered by the area. The first responses were classified and appear in Table VIII. The majority of the respondents (87.5 per cent) stated that the mining company,

TABLE VIII

PARTY RESPONSIBLE FOR RECLAMATION

Party	Per Cent of Respondents
Coal Mining Company	87.5
Coal Company and Provincial Government	7.0
Provincial Government	2.0
Others	2.0
Don't Know	1.5
Total	100.0

carrying out the operations, should be held responsible. The rest said the responsibility fell, in whole or in part, on the provincial government.

A money contribution was suggested as a means to help reclaim strip mined areas. Only 44 per cent of the people interviewed were willing to pay some amount. From this group 38 per cent suggested that the money should be collected on the basis of a provincial-wide tax. The remaining 6 per cent were willing to pay a certain amount through direct taxes of the area involved. No one suggested a voluntary contribution as a means to help the cause. The high percentage (66 per cent) of respondents who were not willing to pay possibly reflects the attitude that, since the coal companies benefit the greatest from the operation, they should also supply the funds to reclaim the area.

To obtain some idea of alternative actions people would take if environmental damage continued without reclamation, they were asked "What would you recommend be done if environmental damage continues and little is done to reclaim the area?" According to Table IX strong legislative action and fines were viewed as the most possible solutions. Others suggested stronger action such as closing down the strip mines. Three per cent exhibited a pessimistic attitude stating that nothing can be done.

TABLE IX
RECOMMENDATIONS TO CURB ENVIRONMENTAL DAMAGE

Recommendations	Percentage of Respondents
Strong Legislative Action	44.0
Large Fines	42.5
Pressure Groups	5.5
Shut down Strip Mining	3.5
Nothing can be Done	3.0
Others	1.5
Total	100.0

PERCEIVED ALTERNATIVES; LAND USE COMPATIBILITY, AND DEVELOPMENT

This section focuses on the perceived land use alternatives besides coal mining that could be developed to boost the economy of the area. Particular attention is given to tourist recreational land use and the perceived compatibility of this use with coal mining. Various attitudes towards future development are also noted.

Perceived Alternatives

The people interviewed were asked to list other alternatives besides coal mining that may boost the economy or bring money into the area. Their first responses

were classified and recorded (Table X). Tourist and

TABLE X
ALTERNATIVES TO THE COAL ECONOMY

Alternatives	Percentage of Respondents
Tourist and Recreational Development	44.5
Industrial Development	22.0
No Economic Alternatives	30.0
Other Alternatives	3.5
Total	100.0

recreational development was perceived by almost half of the respondents as a likely alternative. Industrial development was also rated highly as a possible alternative. However, almost one-third (30 per cent) of the respondents felt that there were no adequate economic alternatives. Perhaps these respondents could have listed other alternatives but they did not perceive any that would be able to replace the coal mining economy. There may also be some confusion due to the wording of this particular question in the questionnaire.

All the people interviewed were asked to rate the tourist and recreational potential of the study area. A large majority (71 per cent) felt the area had "great potential," and 1 per cent listed "no potential."

Almost everyone agreed that the area had at least "some potential" for tourist and recreational development but the main concern was whether this potential would be realized or developed to the degree where the study area would reap economic benefits. To complement the general theme of recreational development the following question was asked, "Do you feel that a person who is just passing through the area is made aware of the tourist and recreational possibilities available?" Almost all the respondents (92.5 per cent) indicated that the existing possibilities were not perceived by the people passing through. Two general reasons may be given for this response. First, there has been very little done to inform the people on the various attractions the study area has to offer. Second, there is no tourist development to entice the people to stop for any length of time so that they could learn more about the area.

Compatibility

The perceived compatibility of land uses was determined by asking the respondents to voice their opinions on the success of tourist and recreational development in the same general area where strip mining was carried out. Over half (53 per cent) of the respondents stated that the two land uses would be compatible for various reasons. (Table XI).

TABLE XI
REASONS GIVEN FOR LAND USE COMPATIBILITY

Reasons	Percentage of Total Response
Strip Mines are Isolated and Do Not Interfere	23.0
Strip Mines can be Viewed as Tourist Attraction Areas	9.0
Others	21.0
Total	53.0

Many respondents (23 per cent) perceived the mines as isolated and not interfering with other land uses. Comments such as, "The strip mines are at 6000-7000 foot level and do not interfere with tourists or recreationists," reflect this attitude. The impression is that if the damage cannot be perceived visually, or does not affect people directly, then it is regarded as insignificant. There appears to be little thought given to other, previously listed, serious damages such as stream pollution or the disruption of wildlife habitat. Nine per cent felt that some of the strip mined areas could be opened up to the public as a tourist attraction. The success of the venture was based on the premise that the area was famous for its coal mining, abandoned mining towns, and strip mines that would generate significant tourist interest if promoted. This particular

reason for compatibility would apply to only a limited number of strip mines. It would not be economically feasible or good ecological practice to develop all the strip mines into tourist attraction sites. However, it may be a successful proposal if one area, such as Grassy Mountain, was promoted to attract the tourist. Twenty-one per cent had to be listed under an "other" category because the responses were so varied. Some of the respondents assigned top priority to the coal mining land use stating, "Tourist sites and recreational areas could be located away from the strip mines." At present this may be possible but if the operation is expanded it will likely affect already established and future recreational potential. It would appear that these respondents also have the impression that strip mining is detrimental to a small isolated area. Others had a more sensible approach and recommended that, with proper planning, strip mines could be located where minimal damage would result. Although this approach may be desirable it is not altogether possible. Unfortunately most of the coal out-croppings occur in mountainous areas that would be difficult to reclaim as witnessed from other operations.

Those people interviewed, who felt that tourist and recreational development would be unsuccessful in a strip mining area, represented 27 per cent of the total

response. Two main reasons were given for their views. Twenty-three per cent stated that strip mining activities had already made a detrimental impact and future recreational and tourist development would be in direct conflict. Particular mention was made to the "scarred landscape" and "polluted streams." The remaining 4 per cent viewed most of the "stripped" areas as impossible to reclaim and further coal mining operations would add to a dilapidated visual impression of the landscape. This they felt would reduce the recreational appeal of the area. It is interesting to note that many of the reasons given for perceived non-compatibility centered around the visual aspect of strip mining damage. At present most of the "strip" areas are removed from public view and it is doubtful if a tourist would perceive the damage. However, if a tourist or recreational industry were to be established a considerable number of people would probably penetrate these areas and obtain a similar dilapidated visual impression of the landscape.

Development

The last formal question asked was, "What types of development or changes, if any, do you think the Pass Area will follow in the future?" Although several respondents were able to list various developments a majority felt that there would be no change or they didn't know what change would take place. Due to the

nature of this response only the first reply was classified (Table XII). One-quarter of the local people felt that the area would carry on the way it has in the past with little change. This pessimistic attitude could in part be explained by the following quote from a retired miner:

I have lived in the Pass all my life and have seen many fancy schemes that were going to do something good for the area. They all fell flat on their face.

TABLE XII
FUTURE DEVELOPMENT OF STUDY AREA

Developments Perceived	Percentage of Respondents
No Change	25.0
Cannot Speculate (Don't Know)	18.5
Tourist and Recreational Development	14.5
Unified Municipal Government	9.5
Area will be Made into a National Park	7.0
Industrial Development	7.0
Stronger Strip Mining Legislation	4.0
Development Dependent on a Number of Factors	14.5
Total	100.0

In the past there have been attempts to revitalize the economy such as the Federal Government Designation of the area. However, this attempt could only be considered partially successful.

One other important factor, the lack of co-operation

between the local people, also contributed to a diversified and haphazard approach to almost any type of development. Several ventures required the co-operation of all the towns but a conflict usually arose when geographic location of the venture was discussed. The communities competed with one another for development prospects (Hadikin and Kane, 1972). This could explain the 9.5 per cent who perceived unified municipal government as a possibility. If the communities were unified under one governing body then planning and progress would proceed in an orderly manner. The 18.5 per cent, who didn't know what developments would take place, felt that they could not tell the future. They did perceive various alternatives but no one particular alternative, in their opinion, would be followed in the future. Approximately one-quarter of the respondents made reference to some aspect of tourist or recreational development. This could possibly be expected from the high rating it received in a previous question. It is interesting to note that 7 per cent feel that the area will eventually become a national park. It is doubtful if they perceive some of the land use problems that would result if it was made into a park. Other respondents felt that any future development in the study area would

depend on a variety of factors.^{*} The somewhat unexpected suggestion, that stronger strip mining legislation would be enacted, was mentioned by 4 per cent of the local people. The reason for this response could be attributed to questionnaire construction. Since the respondent had been bombarded with the term "strip mining damage," he possibly felt obliged to say something to remedy the situation.

GROUP PERCEPTIONS AND ATTITUDES

Cross-tabulations were conducted comparing the responses forwarded by various groups. The objective was to determine if any particular group held certain specific attitudes towards the more controversial issues examined. Unfortunately, many of the cross-tabulations did not allow for test of significance consequently the results were interpreted as general suggestive trends.^{**}

^{*}For example, some respondents stated that coal mining would flourish if the coal companies could secure steaming coal contracts from eastern Canada. Others speculated that tourism and recreation would be emphasized if the government would give financial aid to the area for this type of development.

^{**}The cross-tabulation of the occupational variable with other variables left several relationships undetermined, this would not allow the X^2 test to be conducted.

The newest residents to the study area were in the professional group. Thirty-five per cent of this group had been in the area for less than two years.* In the other occupational groups no significant proportion had made a recent influx.

There was no significant difference in listing likes or dislikes. All groups were fairly evenly distributed in response.

Pollution (air and water) damage rated as the number one problem by approximately 40 per cent of the respondents. However, more than half of the students (55 per cent) felt that wildlife displacement and the ruining of fishing potential was the most important. Similarly, 52 per cent of the retired people felt that destruction of scenic beauty was important as compared to the overall respondent rating of approximately 30 per cent. The miners and professional groups considered that pollution was the major problem with 65 per cent of each group sharing the same opinion.

The seriousness of the damage caused was perceived by the respondents as being "very serious" (15 per cent) and "somewhat serious" (60 per cent). The only strong

*The stated percentage values apply to the group not the total population, so they are all based on a possible of 100 per cent.

deviation from this average response was made by the retired people. Thirty-eight per cent of this group felt that the damage was "very serious." The students also scored higher by having 25 per cent in the "very serious" category. These two groups (retired and student) appear to be orientated towards a preservationist point of view. The retired people may have developed this attitude through experience. The students are possibly more preservationist minded because they are continually exposed to it in lectures. It is interesting to note that both groups are not dependent on the coal mining economy. The miners and professional people comprised the majority of the respondents who felt there was no damage.

Approximately one-half (45 per cent) of the respondents interviewed replied that benefits were greater than the damages caused. The highest percentage representation (67 per cent) came from the commercial and professional groups. Those people who felt that the damages did outweigh benefits were represented strongest by the student and retired groups. It is difficult to speculate why the miner group did not rate as high (58 per cent) as the first mentioned groups.

Two-thirds of the respondents interviewed felt that there was not enough reclamation carried out. The students were most outspoken on this issue supported by

88 per cent of the total group. The housewives contributed to the "do not know" category by having 68 per cent of the group supporting the negative response.

All the occupational groups were strongly in favor of having the company restore the damaged areas. Both the students and retired people put 100 per cent responsibility on the company. Only the professional group deviated slightly and 24 per cent of the group suggested that the company be aided by the government.

Of those willing to pay a certain amount to aid in reclamation procedures, the students and professional groups were most obliging. The strongest objection to payment was made by the retired people with 88 per cent refusing to pay any amount.

The miner, industrial and housewife occupational groups were most pessimistic in selecting alternatives and suggesting future development. The professional and student groups were most responsive in suggesting tourist and recreational development as a possible change. However, it was the student and retired groups who felt that recreational development and coal mining were not compatible. They were opposed by the commercial sector (75 per cent) who perceived both types of land uses as compatible. The miner group had the second highest response (57 per cent).

Some of the cross-tabulations that were carried

out did not yield the correlations expected. For example, the housewives were incorporated into the study to obtain a feminist point of view. However, no outstanding differences were noted when male and female responses were cross-tabulated with various questions. It was also expected that the miner group would be most outspoken on mining issues. Although certain responses tended to indicate an allegiance to the coal company, there were several other instances where views differed. This tends to suggest that there is a response variation in the miner group because both "conservationist" and "exploitive" views are expressed. Other occupational groups showed less response variation.

CHAPTER VI

VISITORS' PERCEPTION OF THE LANDSCAPE

INTRODUCTION

At any one time the study area has an influx of two visitor groups, the recreationists and tourists. Both of these groups, in differing capacities, contribute to the local economy. The actual impact that these visitors have on the economy is difficult to evaluate since few studies or statistics are available. However, as stated previously, there appears to be a lack of tourist activity, in the sense that few tourist dollars are spent, even though many pass through the region. Since tourist and recreationist behavior patterns reflect attitudes and perceptions, an understanding of these factors is essential. By combining this information with the author's personal observations it would be possible to suggest appropriate development proposals that would suit the recreationists and increase tourist interest in the study area.

THE RECREATIONISTS

The recreationists were sampled at ten selected recreational areas during the summer months of June through August, 1972. Because this sampling was

conducted during the summer there is no representation of certain recreational activities that are carried out in other seasons. Thus those people taking part in hunting, skiing, and other activities were not sampled by the questionnaire survey. Where appropriate, cross-tabulation calculations were carried out to interrelate response to group characteristics.

Socio-Economic Characteristics

Approximately three-quarters of the visitors sampled in the recreational areas did not have any university education. Fifty-eight per cent were in the grades 9 - 12 education range.* This is somewhat unexpected since other studies have found that education is a strong factor in outdoor recreation participation (Outdoor Recreation Resources Review Commission Study Report 20, p. 11.) This could possibly be explained by looking at other characteristics.

People in managerial, technical, or professional positions represented 38 per cent of the recreationists sampled. An equal percentage were classified as skilled labour. The remaining occupational positions were split

*The total recreational sample used in the analysis was based on 100, therefore the percentage value and response frequency are the same.

among students (4 per cent), housewives (9 per cent), retired people (2 per cent), and others (9 per cent). Income levels of the respondents did reflect the occupational group.^{*} The majority of the respondents (55 per cent) had an annual income between \$6,001 - 12,000. Ten per cent made less than \$6,001 and 4 per cent listed their annual income as greater than \$20,000.

In the response to the mail-back questionnaire 80 per cent of the respondents were male.

User Characteristics

A high percentage of the recreationists (91 per cent) in the study area came from Alberta. The remaining 9 per cent were distributed with British Columbia contributing 3 per cent, Saskatchewan and Manitoba with 2 per cent each, and Ontario contributing 1 per cent. Also 1 per cent of the recreational visitors came from the United States.

An examination of the provincial distribution revealed that the majority of the recreationists originated within or close to the study area (Table XIII). Approximately 85 per cent of the recreationists originated within 200 road miles from the center of the study

^{*}It was assumed that the housewives stated their husbands income.

area.*

TABLE XIII
PROVINCIAL DISTRIBUTION OF RECREATIONISTS

Towns:	Leth- bridge	Calgary	Study Area	Edmonton	Pincher Creek	Others
Percen- tages:	26.0	17.0	13.0	6.0	4.0	25.0

When asked to list their particular recreational activity in the area, a majority stated that camping and fishing was their prime activity. A minority listed vacationing and 8 per cent named other activities such as sight seeing or hiking (Table XIV). A cross-tabulation revealed that 80 per cent who stated vacationing as their activity were either from Edmonton, Calgary, or out of the province. The recreationists who were camping or fishing came from nearby towns.

TABLE XIV
TYPE OF RECREATIONAL ACTIVITY

Activity:	Camping	Fishing	Vacationing	Others
Percentage:	70.0	12.0	10.0	8.0

* For the study, Frank, Alberta is considered the geographic center of the study area.

More than half of the recreationists (55 per cent) rated the area as "excellent" for their particular activity. Another 32 per cent rated the area as "good" and 13 per cent were split into the "fair" and "not suited" categories. The high regard held for the area was voiced by a respondent who commented that, "The area is one of the finest camping areas in Canada." No one campsite, out of the ten sampled, was rated as being more suitable for a particular recreational activity.

Table XV lists the time that the recreationists spent in the study area. Approximately one-third of the visitors planned to stay in the area one to three days. This percentage could possibly be attributed to a weekend influx. Others (23 per cent) indicated that they would be in the area for about a week. Generally, those people who travelled a great distance stayed in the area for a longer period of time. However, there were a small percentage that used the sites as a temporary stop-over on their way to another destination.

TABLE XV

RECREATIONISTS LENGTH OF STAY

Number of Days:	1 Day	1-3 Days	4-6 Days	7 Days	Live in Area
Percentage:	11.0	36.0	23.0	17.0	13.0

Most of the visitors felt that they were either "familiar" (48 per cent) or "somewhat familiar" (45 per cent) with

the study area. Seven per cent stated that they were "not familiar" with the area. Those who were "not familiar" and "somewhat familiar" originated furthest away from the study area. For example, 76 per cent of the people from Calgary and 61 per cent of the people from out of the province fell into these categories. The recreationists, who originated close to the study area, tended to be "familiar" with the area.

From the analysis of the user characteristics it is apparent that the recreationists do not contribute substantially to the economic base of the study area. Most visits originate close to it and subsequently most expenditures are in those regions. The visitors who have come a long distance and stay in the area for a number of days do contribute to the local economy. Unfortunately, these contributions are almost exclusively restricted to the summer period. During winter access to the recreational sites is not available and naturally camping and fishing activities are at a minimum. The forecast increase in recreational use will increase expenditures but the actual economic impact on the study area would be difficult to determine. Although this impact is difficult to evaluate it is evident that the estimated 312,500 visits in 1972 must have made a significant economic contribution to southern Alberta (Longworth, 1970, p. 3). What is needed is more expenditure in the study area.

One other aspect worth considering is the aesthetic value of the study area that cannot be evaluated in economic terms. If something should interfere with these values the recreational potential may be ruined. Proper land use must be stressed to insure that this does not happen. The analysis of visitor perceptions and attitudes may give an indication of the type of land use needed, from both an economic and aesthetic point of view.

Perception of the Landscape and Related Problems

"The Crowsnest Pass Area is a busy recreational corridor and the landscape scenery is equivalent to Banff" (Respondent, 1972). The majority of the recreationists interviewed rated the surrounding landscape as "very attractive" (68 per cent). Only 1 per cent regarded the surrounding landscape as "unattractive." According to the cross-tabulation figures those people who were familiar with the area were most responsive in the "very attractive" category. Those people who were "somewhat familiar" or "not familiar" with the area tended to perceive it as "attractive or "unattractive."★ The people in the mid to high income range tended to be more appreciative

★Familiarity correlated well with distance, therefore it would also be possible to state that the respondents, who were not from the immediate region of the study area, gave a lower ranking to landscape attractiveness.

of landscape attractiveness giving it a higher rating compared to the people in the low income bracket. When the respondents were asked to list what they felt were advantages, a majority (64 per cent) perceived the area as "natural wilderness" and outstanding in "scenic beauty" (Table XVI). The mentioned advantages closely correspond to the advantages listed by the local people interviewed. Those people who were "familiar" with the area tended to list more varied advantages such as "good accessibility" or "many points of interest." Others made reference almost exclusively to the "outstanding scenery" or recreational capability. It is likely that the people who are "not familiar" with the study area are not aware of the "many points of interest" available.

TABLE XVI
PERCEIVED ADVANTAGES OF THE STUDY AREA^{*}

Advantage Listed	Percentage of Respondents
Outstanding Scenery	64.0
Good Recreational Area	14.0
Not Overcrowded	6.0
Good Accessibility	5.0
Many Points of Interest	4.0
Others	7.0
Total	100.0

^{*}Many of the respondents gave only one reason or response even though multi-response was possible. In view of this circumstance only the initial response was classified.

To obtain the opposite point of view the recreationists were asked to list some of the elements they perceived as problems or disadvantages (Table XVII). Strip mining damage was perceived as a major problem by 26 per cent of the respondents. Thirty-two per cent of the people who voiced this problem were "familiar" with the area. However, 18 per cent who were "somewhat familiar" and 14 per cent who were "not familiar" with the area also perceived strip mining as a problem. In general, this latter group tended to list the "lack of recreational facilities" and "bad travelling roads" as major disadvantages. The respondents who complained about the bad roads made specific reference to the Kananaskis Road. Some (6 per cent) regarded "exploration trails," made by coal and oil companies, as detracting from the scenic landscape. Eighteen per cent were quite satisfied and did not perceive any disadvantages. They felt the area was

TABLE XVII

PERCEIVED DISADVANTAGES OF THE STUDY AREA

Problems Listed	Percentage of Respondents
Strip Mining Damage	26.0
Nothing	18.0
Over-Crowding	15.0
Lack of Recreational Facilities	12.0
Exploration Trails	6.0
Bad Travelling Roads	6.0
Others	17.0
Total	100.0

fine just as it was. A cross-tabulation, using income and perceived disadvantages as variables, did not yield conclusive results.

Awareness and Expressed Attitudes Towards Surface Mining

"The tourist dollar is better than coal. In the future there will be no coal and no money" (Respondent, 1972). Almost all the recreationists (98 per cent) interviewed were aware that the Crowsnest Pass Area was a coal mining district. The respondents were then asked if they had actually seen a surface coal mining operation in the study area. Approximately two-thirds (60 per cent) replied in the affirmative; most of these people (80 per cent) were also "familiar" with the area. Almost half (43 per cent) who stated they were "not familiar" with the area replied in similar fashion. The 40 per cent who did not actually see a surface coal mining operation in the area were excluded from answering questions pertaining to the operations. This exemption was necessary since comments from this particular group would be influenced by their perception of other strip mining operations not related to the study area.

Based on the total population 55 per cent felt that surface coal mining did cause environmental damage, "Destruction of landscape beauty" was perceived as the most serious damage with "water pollution" ranking second. Other damages ranked were "destruction of wildlife habitat"

and "others." Five per cent felt that there was no "real" damage inflicted on the environment. No conclusive results could be drawn from cross-tabulation values. The respondents who originate in the Study Area, Calgary, and Edmonton tended to stress scenic damage. The respondents from the Study Area, Pincher Creek, Lethbridge mentioned "water pollution" most often. Commenting on the seriousness of the damage about one-third (30 per cent) perceived the damage as "very serious." Another 24 per cent) regarded the damage as "somewhat serious" with 6 per cent responding "not serious."

When the damages and benefits were evaluated, 37 per cent felt that the benefits did not warrant the damages. Twenty-one per cent of the respondents held the opposite view, while 2 per cent stated that benefits and damages were about equal. No distinguishing characteristics were revealed by cross-tabulation analysis.

Future Tourist and Recreational Development

"The scenic beauty of the area is enough of a criterion for successful tourist and recreational development" (Respondent, 1972). Ninety-three per cent of the recreationists felt the area had either "great potential" or "some potential" as a tourist and recreational area. Following a similar theme 81 per cent felt that further development would be successful. Their reasons for such

an optimistic position are listed in Table XVIII. The majority viewed the area as attractive and suitable for development. The general feeling was the area had the scenic quality and various points of interest that would appeal to the tourist or recreationist. A large percentage also felt that development was necessary. Two main reasons were given. First, it would alleviate the problem of over crowding in the recreational areas. Second, tourist and recreational development is needed to boost the economy of the study area. It is interesting to note that 11.0 per cent felt that the area could act as a focal point for tourist and recreational activities. Just how the area

TABLE XVIII

REASONS WHY DEVELOPMENT WOULD BE SUCCESSFUL

Reasons	Percentage of Total Response
The Area is Suitable for Development	39.0
Development is Needed to Overcome Problems	21.0
The Urban Area can Act as a Focal Point	11.0
Overcrowding of National Parks	5.0
Others	5.0
Total	81.0

could be made into a focal point was not clearly outlined. Others felt that the overcrowding of National Parks will force people to view the study area as an alternative. Those people who were most "familiar" with the area stated

that development would be successful.

A small percentage (15 per cent) of the recreationists sampled did not view recreational and tourist development as a successful venture. Most (11 per cent) felt that development would destroy the "wilderness appeal."

Although the respondents were not specifically asked to rate tourist and recreational development in view of other land uses only 2 per cent perceived strip mining as conflicting with this development. If the question had been worded differently there is a possibility that this type of response would have been greater.

Approximately half (54 per cent) of the recreationists made some additional comments. The majority agreed that tourist and recreational land use was needed but the emphasis was on land use that, "preserved the naturalness of the area." Several respondents commented that they did not want to see the area become commercially orientated like Jasper or Banff National Parks.

THE TOURISTS

The tourists were sampled when they stopped at the Frank Slide. They were given both written and verbal instructions to first drive through the defined study area and then to answer the questionnaire. The majority of the tourists indicated that they were proceeding directly westward. This route would take them through the urban

area. In this respect their landscape view would be similar to the local people's but different than the recreationists, who did not necessarily have to pass through the urban corridor. In total, one hundred and eighteen questionnaires were returned and all were used in the analysis stage.

Socio-Economic Characteristics

A large percentage of the tourists (37 per cent) sampled had university experience with 15 per cent having an undergraduate degree and 9 per cent with a graduate degree. This was balanced by 39 per cent who had taken grade twelve or less.

The majority of the tourists were in managerial, technical, or professional positions. The income range reported was classified in the mid to high income bracket with 55 per cent having an annual income over \$12,000. From this particular group 18 per cent listed their income to be over \$18,000. Only 4 per cent reported an annual income of less than \$6,000.

The income and education levels characteristic of the tourists would appear to be higher than the recreationists and much higher than the local people. The tourists would appear to compare favorably, in socio-economic characteristics, to the visitors in the National Parks.

In response to the mail-back questionnaire, 83 per cent of the respondents were male.

User Characteristics

According to Table XIX a large proportion (63 per cent) of the tourist visitors came from outside Alberta.

TABLE XIX
DISTRIBUTION OF TOURIST VISITORS

State and Province:	British Columbia	Alberta	Saskatch- ewan	Manitoba	Ontario	United States
Percentage:	12.0	37.0	8.0	5.0	10.0	28.0

The 28 per cent who originated in the United States came from eighteen different states with Washington generating the most, 4 per cent. This areal distribution is markedly different than the sampled recreationists. In that survey only 9 per cent of the visits originated outside Alberta. A cross-tabulation analysis revealed that tourists who were "not familiar" with the area came from out of the province or from Edmonton. Only 10 per cent of the tourists felt that they were "familiar" with the area. Forty-two per cent stated that they were "somewhat familiar" and the majority (48 per cent) said they were "not familiar" with the study area. Even the tourists who were from near by areas felt that they were only "somewhat familiar" with

the region.

The majority of the tourists (63 per cent) stated that they would be passing through and planned to stay in the area less than two hours (Table XX).

TABLE XX
TOURIST LENGTH OF STAY

Hours:	Less than 2	2-6	7-24	More than 24
Percentage:	63.0	16.0	12.0	9.0

Only 9 per cent planned to stay in the study area for more than one day. As expected, those who were "not familiar" with the area planned to stay for the shortest length of time. If most of the tourists are "not familiar" with the area and plan to stay for less than two hours it is unlikely that much money will be spent in the area. According to the local people the tourists are not aware of the potential the area has to offer.

Perception of the Landscape and Related Problems

"As one drives through the area one views beautiful scenery, then historic and other points of interest, and finally, dirty towns and pollution" (Respondent, 1972). Approximately three-quarters (76 per cent) of the tourists perceived the surrounding landscape as either "very attractive" (39 per cent) or "attractive" (37 per cent).

Seven per cent perceived the landscape as "not attractive." When asked to list things that they perceived as advantages, 37 per cent listed "natural scenic beauty" as an advantage. An equal percentage perceived interesting landscapes and points of interest as advantages. In this regard the Frank Slide was mentioned most often.

The tourists were then asked to reply in an opposite fashion and list things they felt were disadvantageous. These responses are summarized in Table XXI. More than half (53 per cent) of the visitors made some comment regarding the dirty and dilapidated urban environment.

TABLE XXI
PERCEIVED DISADVANTAGES OF THE STUDY AREA

Disadvantages	Percentage of Respondents
Coal Pollution	29.0
Deteriorated Urban Areas	24.0
Lack of Tourist Development	19.0
Lack of Tourist Information	12.0
No Disadvantages	9.0
Others	7.0
Total	100.0

The general impression is that, compared to the natural environment of the surrounding areas, the physical appearance of the urban environment is one of being run-down and blighted. This in itself possibly discourages the tourist

from stopping for any length of time.

Almost one-third (31.0 per cent) complained that there was very little tourist development or information. These complaints are legitimate because there has been no serious attempt made to develop the potential of the study area. According to the Oldman River Regional Planning Commission (1970, p. 17), "The most elementary services normally associated with tourist activity are almost completely lacking." Information also seems to be lacking. As stated previously 48 per cent were "not familiar" with the area and were surprised to learn that it has so much tourist potential.^{*} The 9 per cent who listed "no disadvantages" may have made exclusive reference to the "natural" region excluding the urban environment. A cross-tabulation indicated that the people from outside Alberta complained most about the lack of development and information. This complaint also correlated quite highly with the high income level.

Awareness and Expressed Attitudes Towards Surface Mining

More than one-third (35 per cent) of the tourists were unaware that the Crowsnest Pass Area was a coal mining district. Less than half (43 per cent) had actually seen a surface mining operation in the area. Only

^{*}This information was deduced from conversation with other tourists who were not sampled.

those people who had not seen a strip mine were allowed to comment on the following questions.

Out of the total sample 35 per cent considered surface mining as causing damage to the environment of the area, and rated landscape destruction as the most serious (25 per cent). Air and water pollution ranked second (7 per cent) and wildlife habitat destruction was ranked third (3 per cent). A minority (6 per cent) felt that there was no damage caused by strip mining. The damage was rated as "somewhat serious" by 21 per cent of the tourists. The damages and benefits were perceived as equal with 15 per cent responding to each view point. Seven per cent did not know how to evaluate the two concepts since they were "not familiar" with the area.

Future Tourist and Recreational Development

The study area was perceived as having "some" (46 per cent) or "great" (42 per cent) tourist and recreational development potential. Sixty-eight per cent felt that further development would have a good chance of success and listed the following reasons (Table XXII).

TABLE XXII

REASONS WHY DEVELOPMENT WOULD BE SUCCESSFUL

Reasons	Percentage of Respondents
Scenic Variety and Recreational Capability	28.0
Many Points of Interest	16.0
Overcrowding of National Parks	13.0
Others	11.0
Total	68.0

The 9 per cent who were of the opposite opinion as to the success of development viewed the urban environment as unattractive and spoiling any tourist proposals. Twenty-three per cent did not know if development would be successful. Since many of the respondents were "not familiar" with the area, they are also likely to be non-familiar with the potential.

CHAPTER VII

STUDY FINDINGS AND APPLICATIONS

This study has investigated some of the land use related problems by assessing public perception and attitudes towards the landscape. The use of perception as a research technique is a relatively new approach that has certain conceptual difficulties. At present the interaction of various components in the perceptual process are not well understood. As Sadler (1970, p. 130) states, "How the individual's perception of environment is acquired, altered, and integrated into conceptual systems and translated into environmental behavior remains to be discovered." These conceptual problems reflect practical difficulties in the application of perception as a research technique. The actual measurement of perception and various methods of doing this sometimes encounter both theoretical and methodological deficiencies. However, one means of better understanding and possibly alleviating some of these deficiencies is through application. Despite certain discussed limitations the study findings do point out areas of interest and can be viewed as one input into an involved planning process.

STUDY FINDINGS

Both the "local" and "visitor" groups rated the landscape as being "very attractive." Perceived elements that enhanced the quality of the landscape were listed as "outstanding scenic beauty" and "good recreational capability." Some of the recreationists regarded the landscape as "natural wilderness."

Most of the perceived disadvantages or problems listed by the local people applied to the urban environment. Coal blight and the lack of community co-operation were viewed as the most serious. Compared to these problems of an immediate nature strip mining damage was not perceived as a major problem. Similarly, when improvements were listed to enhance the attractiveness of the surrounding area, the recommendations again applied to the local urban environment. From this it is observed that the local residents tend to perceive the problems they are in contact with almost daily rather than other problems, possibly more serious, that are removed from their immediate environment. There is also an indication that the local people do not perceive the urban blighted area as part of the more attractive surrounding landscape. One other important aspect applies to the people themselves. Although they are perceived as "friendly and obliging," there is a lack

of co-operation between communities. This lack of co-operation has no doubt had a dampening impact on possible land use developments that could aid the area economically. The tourists also viewed the urban area as coal blighted and dilapidated. This disadvantage was listed as one reason why some tourists did not stop. Others complained that there was no tourist information or facilities. They claimed the study area lacked good restaurants, shopping outlets, and overnight accommodation. Many of the tourists were not aware of the various recreational areas or points of interest that they could visit. This potential is not being developed and subsequently little tourist spending is taking place. The recreationists, commenting mainly on the rural environment, perceived strip mining damage as the most serious problem. Other mentioned disadvantages were the lack of recreational facilities and overcrowding.

When attitudes towards strip mining were investigated almost everyone agreed that strip mining did inflict damage on the environment of the study area. Air and water pollution followed by landscape disturbance were perceived as the first and second most serious damages by both "local" and "resource management" groups. Those of the "visitor" group, who had actually seen a surface mining operation, ranked landscape destruction as the most serious damage. The resource management officials

and recreationists were most concerned and rated the damage as "very serious." These two groups also felt that the benefits derived were not worth the damages inflicted. Approximately half of the local people felt that employment benefits out-weighed the damages. However, it is questionable if the employment derived from surface mining, as distinct from underground mining, is that vital to the economy of the study area. Both the local people and tourists regarded the damage as "somewhat serious."

Only the resource management officials and local people were asked questions related to reclamation. This was necessary because it could not be assumed that the "visitor" group was aware of reclamation related issues. Almost everyone interviewed felt that reclamation was necessary and, at present, inadequate. One of the resource officials made a comment that only a "token" effort at reclamation has been shown. Most of the local respondents had an idealized impression that reclamation was capable of restoring the landscape to its original state. According to the "resource" group, this, from an economic and technologic point of view, is impossible in most cases. They recommended that the coal company should have to post a reclamation bond to insure that something is done when a strip mine is abandoned. There was a noted lack of awareness among local people in the sense that 25 per cent did not know the amount of

reclamation that had been enacted. It was generally agreed that the responsibility to carry out needed reclamation should fall on the coal company. Less than half of the local respondents were willing to contribute some money towards the cause. If reclamation was not carried out and environmental damage continued, government legislation and large fines were perceived as the best action to curb the situation. However, all the resource officials felt that existing legislation was either "not enforced" or "inadequate."

About half of the local people interviewed and all the resource officials viewed tourist and recreational development as a viable alternative to the coal economy. All the groups interviewed regarded the area as having either "great" or "some" potential for this type of proposal. The tourists felt it would be successful because the area has "natural scenic beauty" and "many points of interest." The recreationists regarded development as essential to alleviate overcrowding problems both in the study area and in the National Parks. Several other respondents recommended that the urban area should be made into a focal point for activities that would boost the economy of the region. Particular mention was made to develop various interest points and erect a coal mining museum that would capture the interest of people who were visiting the area. This view corresponds to a tourist's

suggestion that, "Improvements should be made so tourists could stop in the area and spend some time rather than just taking a few pictures and leaving" (Respondent, 1972). A minority viewed further development as destroying the "wilderness appeal." They cautioned that "commercialization" was undesirable and further proposals should keep this in mind. Very few recreationists mentioned the land use conflict between mining and recreational use.

Over half of the local respondents perceived both strip mining and tourist and recreational land use as compatible in the same general area. This opinion was deduced from the perception that strip mines and the subsequent damages were isolated and affected only a small area. Little consideration was given to the possibility of future expanded coal mining operations. The resource officials held the opposite view. One felt that at present both uses were compatible but that this would not be true in the future. The remaining three officials and twenty-seven per cent of the local respondents perceived the two land uses as incompatible.

Although a majority of the local respondents perceived the land uses as compatible and rated recreational development highly, very few felt that it would take place. Approximately one-quarter of the respondents saw no land use change from the present. This attitude was primarily based on past experience with development plans

and the present lack of co-operation between the communities hampering most joint proposals. The resource management officials were optimistic about tourist and recreational development of the area and felt it would receive top priority from the Provincial Government.

Cross-tabulation analysis of the local residents indicated student and retired occupational groups as most prone towards a preservationist attitude. The miner and housewife groups, in most cases, represented the opposite view. The commercial groups responded best to questions dealing with economic alternatives. Cross-tabulation analysis of "visitor" socio-economic variables and expressed perceptions and attitudes were inconclusive. One reason for this result can be attributed to the almost homogeneous socio-economic make-up of the group. However, those people out of the group who originated furthest away from the study area tended to be least "familiar" with it. As a result they were unaware of other attractions available in the study area.

The recreationists and tourists were quite different in their user characteristics. Most of the recreationists originated within two hundred miles of the centre of the study area. The majority listed "camping" and "fishing" as their major activity. Most of the recreationists planned to stay in the area between one and three

days. On the other hand, two-thirds of the tourists originated from outside Alberta. Sixty-three per cent planned to stay in the area for less than two hours and stated that they were just passing through.

APPLICATION OF STUDY FINDINGS

The findings indicate that the study area has great potential for tourist and recreational development. Furthermore, both tourists and recreationists agreed that development would be successful. However, if the area is to benefit economically certain factors must be taken into consideration. An analysis of user characteristics reveals that increased recreational use of the Forest Reserve alone will not contribute greatly to the economy of the study area. Tourist spending, on the other hand, appears to be a major unexplored source of revenue. In order that this tourist revenue might be collected, four requirements must be made to attract the visitors:

1. Promote existing tourist and recreational sites.
2. Develop additional attraction sites in the area.
3. Clean up the blighted urban environment.
4. Establish adequate tourist facilities.

The promotion of existing sites would bring a more intensive use of these features. This would involve promoting: fishing, hunting, camping, and hiking in the Forest

Reserve. To inform the tourists, signs should be erected at geologic "Points of Interest" such as "The Cave." Special consideration must be given to additional development if maximum economic benefit is to be achieved. This development must establish the urban corridor as a focal point for both the tourists and recreationists. Three major proposals could achieve this aim. The development of the sulphur spring at Frank would allow the focus to be centered on the urban corridor.^{*} This facility would allow for both summer and winter use possibly attracting skiers from the West Castle Ski Area. Relying on the coal mining history of the area, a unique tourist attraction could be created by constructing a coal mining museum. The museum could pass out information on the history of the area and have maps marking historic coal mining buildings such as at Passburg. Tours of underground and strip mines could be arranged to promote tourist interest. The development of a good road system, connecting Waterton Lakes and Banff National Park, would increase tourist and recreationist access to the study area. The Crowsnest Pass

^{*}In 1964 a report was prepared by Gilbert M. Rekken and associates for the development of the springs. Rekken proposed heating the sulphur springs to 105°F, thus creating a hot sulphur pool. Two separate swimming pools were incorporated to utilize the water from the fresh-water spring. Office space, community meeting facilities, general dining facilities, and patios were part of the swimming pool complex. A motel was to be overlooking the complex. The proposal was never developed due to a conflict between the developers and local people.

urban area could be a mid-point stop over for the people travelling from either Park. These three major developments, coupled by the other requirements listed, would establish the urban corridor as a focal point and contribute in stabilizing the economy (Griess, Deasy, 1964).

The conflict between tourist and recreational land use and surface coal mining is difficult to evaluate. The study findings confirm that different groups of people have different perceptions and attitudes towards the same landscape. This could partially be attributed to the experience of the viewer as Lowenthal suggests, "What makes one landscape appear harmonious, another incongruous, is the entire experience of the viewer" (1962, p. 23). The local people and the resource management officials differed markedly on certain issues. In particular, the officials perceived recreational land use and surface mining as incompatible. This judgment was based on direct experience with the various issues involved. Furthermore, their opinion was no doubt influenced by prior knowledge of possible additional surface mining and exploration ventures. The opinions voiced by the resource officials accentuates an important concept. If the study area is to receive tourist and recreational development while surface mining is continued at present or expanded rates a crisis will develop. The time to deal with this growing dilemma is now so

that effective land use policies can be initiated.

SUGGESTED RESEARCH

The study has identified several areas of concern that require further research consideration. In particular, research effort should be aimed at three separate but interrelated aspects that affect the study area.

Impact studies are required to assess the effects of surface mining on wildlife patterns. It has been determined that surface mining does destroy wildlife habitat but little is known about the subsequent wildlife migration and feeding patterns. To complement this research a microclimatic study, investigating the possibility of reclaiming strip areas, could be carried out. In most cases the success of reclaiming strip mining sites depends on a number of factors such as precipitation, altitude of site, slope of terrain, and annual thermal regime. The study of these climatic factors coupled with the information on wildlife patterns could help define recognizable ecological areas or zones where surface mining for coal may or may not take place.

Further research could look more specifically at various proposed developments in the study area that would attract visitors. In this respect the market potential for each proposal would have to be evaluated. Particular attention should be paid to possible

developments that would promote winter use. The feasibility of developing other skiing areas, in the northern portion of the study area, would be one such consideration.

One other area of research could deal with an indepth investigation of the local people's perception of the landscape. Specific reference has been made concerning two perceived environments. The first is the localized blighted urban area. The second is a wider but personally more distinct attractive "natural" environment. It would be interesting to determine why these environments are erected and to what extent are the problems in one considered to affect or be relevant to the other. Furthermore, it might be possible to find out what the local people regard as "real" or "serious" damage. Obviously the resource management officials and local people utilized different criteria to evaluate the same environmental situation. Additional research could identify the different criteria operative in the perception of the landscape.

B I B L I O G R A P H Y

BIBLIOGRAPHY

- Alberta, Department of Lands and Mines, 1905-1950, Annual Report of the Mines Division, Edmonton, King's Printer.
- Alberta, Department of Mines and Minerals, 1951-1971, Annual Report of the Mines Division, Edmonton, L. S. Wall, Queen's Printer.
- Alberta, Department of Mines and Minerals, 1968, The Coal Mines Regulations Act, Edmonton, L. S. Wall, Queen's Printer.
- Alberta, Department of Youth Research Division, 1967, "Recreation In The Crowsnest Pass, A Survey of Interests, Activities And Opportunities," An unpublished report, 465 pp.
- Alberta Land Preservation Society, 1969, "Coal Mining Damage In Alberta." An unpublished brief submitted to the Government of Alberta, 38 pp.
- Alberta, Environment Conservation Authority, 1971-1972, Proceedings, The Impact On The Environment of Surface Mining In Alberta, Part I, Edmonton, 444 pp.
- Amidon, E., and Elsner, G. H., 1968, "Delineating Landscape View Areas. . . A Computer Approach," U.S.D.A. Forest Service Research Note PSW-180, Pacific Southwest Forest and Range Experiment Station, Berkeley, California, 4 pp.
- Anderson, F., 1968, The Romantic Crow's Nest Pass, Frontier Book No. 5, Calgary, Frontiers Unlimited, 56 pp.
- Barker, M., and Burbon, I., 1969, Differential Response to Stress in Natural and Social Environments: An Application of a Modified Rosenzweig Picture-Frustration Test, Toronto, University of Toronto, Natural Hazard Research Working Paper No. 5, 18 pp.
- Barrows, H. H., 1923, "Geography as Human Ecology" A.A.A.G., Volume 13, No. I, pp. 1-14.

- Bartley, S. H., 1958, Principles of Perception, New York: Harper Brothers, 482 pp.
- Burton, I., 1961, Changes in the Urban Occupance of Flood Plains In The United States, G. F. White (ed.), Chicago, University of Chicago, Department of Geography Research Paper No. 57, pp. 84-92.
- Canada, 1966, Census of Canada 1966, Ottawa, Dominion Bureau of Statistics.
- Canada, 1971, Census of Canada 1971, Ottawa, Statistics Canada.
- Canada, Department of Industry, 1965, "Area Development Program Announcement," News Release, Ottawa, 2 pp.
- Christmas, L. P., 1969, Coal and Coke, Mineral Resources Branch, Department of Energy, Mines, and Resources, Ottawa, No. 15, 17 pp.
- Clawson, M., Knetsch, S. L., 1966, Economics of Outdoor Recreation, Baltimore: Hopkins Press, 328 pp.
- Coughlin, R. E., and Goldstein, K. A., 1970, Extent of Agreement Among Observers on Environmental Attractiveness, Philadelphia, Regional Science Research Institute Research paper No. 37, 56 pp.
- Cousins, W. J., 1952, "A History of the Crow's Nest Pass." Unpublished M.A. thesis, University of Alberta, Department of History, 214 pp.
- Davidson, E., 1971, Proceedings, Impact on the Environment of Surface Mining In Alberta, brief submitted to the Environment Conservation Authority, Alberta, pp. 190-196.
- Dawson, G. M., 1886, "Preliminary Report on the Physical and Geological Features of that portion of the Rocky Mountains Between Latitudes 49° and 51° 30'," Geological And Natural History Survey of Canada, Montreal: Dawson Brothers, 131 pp.
- Edmonton Journal, 1971, Editorial, January 18.
- Financial Post, 1968, "Don't Write off Coal: its Market Still Grows," July 20.

- Financial Post, 1969, "Coal becomes Crown Prince of Canadian Exports," August 23.
- Fines, K. D., 1968, "Landscape Evaluation: A Research Project in East Sussex," Regional Studies, Vol. 2, No. 1, pp. 41-45.
- Francaviglia, R. V., 1970, "The Morman Landscape: Existence, Creation, and Perception of a Unique Image in the American West," University of Oregon. Unpublished Ph.D. thesis.
- Glacken, C. J., 1956, "Changing Ideas of the Habitable World," in W. L. Thomas (ed.), Man's role in Changing the Face of the Earth, Chicago: University of Chicago Press, pp. 70-92.
- Graveland, D., and Radford, D. S., 1972, "The Water Quality of Some Coal Mine Effluents And Their Effects on Stream Benthos and Fish." Unpublished report prepared by Fish and Wildlife Division, Lethbridge, 46 pp.
- Griess, R. P., and Deasy, G. F., 1964, "Economic Impact of a New Pennsylvania Tourist Facility," Land Economics: A Quarterly Journal of Planning, Housing, and Public Utilities, Vol., 40, No. 2, pp. 209-222.
- Hadikin, W. F., and Kane, P., 1971, Crowsnest Pass May-September 1971, Ottawa, Planning Services Information Canada, 39 pp.
- Halferdahl and Associates, Ltd., 1973, "Coal Land Holdings - Fernie (82a) Sheet," Edmonton, Alberta.
- Jamieson, E. D., 1971, "Strip Mining of Coal and Conservation of Environment," in Proceedings, The Impact on the Environment of Surface Mining in Alberta, Environment Conservation Authority, Alberta, pp. 126-129.
- Kates, R. W., 1962, Hazard and Choice Perception in Flood Plain Management, Chicago: University of Chicago, Department of Geography Research Paper No. 78, 157 pp.
- Kirk, W., 1963, "Problems of Geography," Geography, Vol. 40, No. 4, pp. 357-371.

- Leopold, L. B., 1969, "Landscape Esthetics," Natural History, Vol. 78, No. 8, pp. 37-44.
- Lethbridge Fish and Game Association, 1971, Proceedings, The Impact On The Environment of Surface Mining in Alberta, Environment Conservation Authority, Alberta, p. 123.
- Lewis, G. M., 1962, "Changing Emphasis in the Description of the Natural Environment of the American Great Plains Area," Transactions, Institute of British Geographers, No. 30, pp. 75-90.
- Lickorish, L. J., 1970, "Planning For Tourism," in T. Burton (ed.), Recreation, Research, and Planning, London: George Allen and Unwin, Ltd., pp. 166-185.
- Linton, D. L., 1968, "The Assessment of Scenery as a Natural Resource," Scottish Geographical Magazine, Vol. 84, pp. 219-238.
- Longworth, G. A., 1970, "Report on Travel Within the Crowsnest Forest in the Year 1970." Unpublished report compiled by the Crowsnest Forest, Blairmore, Alberta, 3 pp.
- Longworth, G. A., 1972, "Crowsnest Forest Recreation Area Survey." Unpublished report compiled by the Crowsnest Forest, Blairmore, Alberta, 9 pp.
- Lowenthal, D. L., 1961, "Geography, Experience, and Imagination: Towards a Geographical Epistemology," A.A.A.G., Vol. 51, No. 3, pp. 241-260.
- Lowenthal, D. L., 1962-63, "Not every prospect pleases: What is our criterion for scenic beauty?" Landscape, Vol. 12, No. 2, pp. 19-23.
- Lowenthal, D. L., 1968, "The American Scene," Geographical Review, Vol. 58, pp. 61-88.
- Lowenthal, D. L., and Prince, H., 1965, "English Landscape Tastes," Geographical Review, Vol. 55, pp. 186-222.
- Machinko, G., 1971, "Man and Nature: Two Viewpoints-- No Perspective," Association of Pacific Westcoast Geographers Yearbook, Vol. 33, pp. 19-38.

- MacIver, I., 1970, Urban Water Supply Alternatives: Perception and Choice in the Grand Basin, Ontario, Chicago: University of Chicago, Department of Geography Research Paper No. 126, 178 pp.
- Michalsky, W., 1971, Proceedings, The Impact on The Environment of Surface Mining In Alberta, Environment Conservation Authority, Alberta, pp. 187-188.
- Miller, R. S., 1971, Alberta's Hunting and Fishing Resources an Economic Evaluation, Alberta Department of Agriculture, Economics Division, Edmonton, Alberta, 89 pp.
- Oldman River Regional Planning Commission, 1969, Alberta Crowsnest Pass Subregional Study, Alberta, No. 2, 187 pp.
- Oldman River Regional Planning Commission, 1970, Alberta Crowsnest Pass Subregional Study, Alberta, No. 3, 199 pp.
- Outdoor Recreation Resources Review Commission, Study Report 20, Participation in Outdoor Recreation: Factors Affecting Demand Among American Adults, Washington, D.C., U. S. Government Printing Office, 100 pp.
- Rabinowitz, C. B., and Coughlin, R. E., 1970, Analysis of Landscape Characteristics Relevant to Preference, Philadelphia, Regional Science Research Institute Research Paper No. 38, 86 pp.
- Rabinowitz, C. B., and Coughlin, R. E., 1971, Some Experiments in Quantitative Measurement of Landscape Quality, Philadelphia, Regional Science Research Institute Research Paper No. 43, 57 pp.
- Rekken, G. M., and Associates, 1964, Development Feasibility Report to Crow's Nest Pass Development Association, Edmonton, Alberta, 38 pp.
- Riley, D., Primrose, T., and Dempsey, H., 1968, The Lost Lemon Mine, Frontier Book No. 4, Calgary, Frontiers Unlimited, 40 pp.
- Saarinen, T., 1966, Perception of the Drought Hazard on the Great Plains, Chicago: University of Chicago, Department of Geography Research Paper No. 106, 183 pp.

- Saarinen, T. F., and Cooke, R. V., 1970, "Public Perception of Environmental Quality in Tucson, Arizona," Occasional Papers, No. 9, London: University College London, Department of Geography, 17 pp.
- Sadler, B., 1970, "Conflicts of Perception and Use In Banff National Park. Unpublished M.A. thesis, Edmonton: University of Alberta, Department of Geography, 155 pp.
- Schiff, M. R., 1970, Some Theoretical Aspects of Attitudes and Perceptions, Toronto: University of Toronto, Natural Hazard Research Working Paper, No. 15, 20 pp.
- Semple, E. C., 1911, Influences of the Geographic Environment, New York: Henry Holt and Company.
- Sewell, D. R., 1971, "Integrating Public Views in Planning and Policy Making," in D. Sewell and I. Burton (eds.), Perceptions and Attitudes in Resource Management, Resource Paper No. 2, Department of Energy, Mines and Resources, Ottawa, Canada, pp. 125-131.
- Shafer, E. L., Hamilton, J. F., and Schmidt, E. A., 1969, "Natural Landscape Preferences: A Predictive Model," Journal of Leisure Research, Vol. 1, No. 1, pp. 1-21.
- Sonnenfeld, J., 1967, "Environmental Perception and Adaptation Level in the Arctic," in D. Lowenthal (ed.), Environmental Perception and Behavior, Chicago: University of Chicago, Department of Geography Research Paper No. 107, pp. 165-169.
- Systems Research Incorporated, 1968, A Sociological Survey of the Crowsnest Pass, Edmonton, Alberta, 52 pp.
- Tajfel, H., 1968, "Social Perception," in D. Sills (ed.), International Encyclopedia of the Social Sciences, Vol. 11, New York: MacMillan Co., and Free Press, pp. 567-575.

- Tuan, Y. F., 1960, "Topophilia or Sudden Encounter with the Landscape," Landscape, Vol. 11, No. 1, pp. 29-32
- Tuan, Y. F., 1971, "Geography, Phenomenology, and the Study of Human Nature," Canadian Geographer, Vol. 15, No. 3, pp. 181-192.
- Walpole, R. E., 1968, Introduction to Statistics
New York: The Macmillan Company, 365 p.
- White, G. F., 1945, Human Adjustment to Floods: A Geographical Approach to the Flood Problem in the United States, Chicago: University of Chicago, Department of Geography Research Paper No 28, 236 pp.
- Wood, L. J., 1970, "Perception Studies in Geography," Transactions, Institute of British Geographers, No. 50, pp. 129-142.

A P P E N D I C E S

APPENDIX I. The C.N.P. Questionnaire

APPENDIX II. Recreational Questionnaire

APPENDIX III. Tourist Questionnaire

APPENDIX IV. Resource Management Questionnaire

APPENDIX V. Present Coal Mining Legislation
and Some Problems

THE CROWSNEST PASS QUESTIONNAIRE

Hello, I'm Wes Hadikin from the University of Alberta, Edmonton. I am conducting a study to find out how people feel about the Crowsnest Pass Area and your household has been selected as a sample. I would appreciate it if you would be kind enough to answer some questions about this area.

In answering the questions, consider the Crowsnest Pass Area as extending East and West from Lundbreck to the British Columbia border and about thirty-five miles North and South of the main Highway No. 3.

1. How long have you been living in this area?
 Years _____ All my life _____
2. What are some of the things you like most about this area, things that you think are advantages? _____

3. What are some of the things you don't like about this area, things that you think are disadvantages? _____

4. In general, how would you rate the attractiveness of the surrounding landscape?
 (a) Very attractive _____ (b) Attractive _____
 (c) Somewhat attractive _____ (d) Not attractive _____
5. Do you feel that the attractiveness of the landscape could be improved in any way?
 Yes _____ No _____ Don't Know _____
 If yes, (List some) _____

 If no, why? _____

The Crowsnest Pass is basically a coal mining area. Nowadays much is heard about the environment and how coal mining, strip or open-pit, operations fit into the overall picture.

6. What do you feel are the greatest benefits that come from coal mining in the Pass? (List some.) _____

7. How long do you feel that mining for coal will continue in this area (number of years)? _____
8. Do you feel that surface mining for coal does any damage to the environment of the Pass Area?
Yes _____ No _____ Don't Know _____
If yes, list some of the damages that you feel are most important. _____

If no, can you be specific why you feel this way?

9. If yes, in Question 8, of the damages that you have just listed above, which one would you rank as being:
(a) The most serious _____
(b) The second most serious _____
10. How serious do you feel is the damage done by surface coal mining in the area?
(a) Very serious _____ (d) Somewhat serious _____
(b) Not serious _____ (e) No damage _____
(c) Don't know _____
11. Do you feel that the benefits from surface coal mining are greater than the damage caused by this operation?
Yes _____ No _____ About the same _____
If yes, (comment) _____
If no, (comment) _____

The word, reclamation, is often used to mean the restoring or reclaiming of damages done to the land by surface mining. However, there are various opinions as to what degree of reclamation is needed since restoring a mining site

costs money. As a result, some people feel that land disturbed by surface mining should not be restored or reclaimed. Others feel that some reclamation should be done even if it is just to smooth out the area. Finally, there are people who feel that the disturbed area should be restored to its original state whenever possible.

12. Do you feel that reclamation is necessary?

Yes _____ No _____ Don't know _____

If yes, what kinds of reclamation do you feel should be carried out? _____

13. Do you feel that there has been enough reclamation done in the Pass Area?

Yes _____ No _____ Don't know _____

14. Whom do you feel should be held responsible to reclaim any damage done to the area? _____

15. Would you be willing to pay a certain amount to help reclaim the damage done to the area by surface coal mining? Yes _____ No _____

If yes, how should it be paid?

(a) Voluntary contribution _____

(b) Direct tax to the area involved _____

(c) Province-wide tax _____ (d) Others _____

16. What would you recommend be done if environmental damage continues and little is done to reclaim the area?

17. How would you personally be affected if the coal mining operations were to be shut down for a long period of time in the near future? _____

Would you leave the area? Yes _____ No _____
Don't know _____

18. Can you see other alternatives besides coal mining that may boost the economy or bring money into the area? _____

19. How would you rate the tourist and recreational potential of the area?
(a) Great potential _____ (b) Some Potential _____
(c) No potential _____ (d) Don't know _____
20. Do you feel that a person who is just passing through the area is made aware of the tourist and recreational possibilities available?
Yes _____ No _____ Don't know _____
21. If this area was further developed to attract the tourists and recreationists, do you think this can be done successfully if surface mining for coal is allowed to continue?
Yes _____ No _____ Don't know _____
If yes, why? _____

If no, why? _____

22. What types of development or changes, if any, do you think the Pass Area will follow in the future?

23. That is just about everything, except for a few facts about yourself:
(a) Occupation _____
(b) Highest Education Level Attained _____

(c) Age _____

(d) Approximate Annual Income (Husband and Wife) _____

24. To be completed after the interview:

(a) Was the respondent: Very co-operative _____

Somewhat co-operative _____

Not co-operative _____

(b) Did the respondent seem: Very interested _____

Somewhat interested _____

Not interested _____

(c) Type of home _____

(d) Sex: Male _____ Female _____

(e) Area from which respondent selected (town) _____

(f) Date of interview _____

(g) Time of interview _____

(h) Length of interview _____

Comments:

APPENDIX II

RECREATIONAL QUESTIONNAIRE

Hello, I'm Wes Hadikin from the University of Alberta, Edmonton. I am conducting a study to find out how people feel about the Crowsnest Pass Area. I would appreciate it if you would be kind enough to answer some questions about this area.

In answering the questions, consider the Crowsnest Pass Area as a circle with its centre at the Frank Slide and a radius of about thirty-five miles.

1. Your home address is: Town (City) _____
Province (State) _____
2. How familiar are you with this area?
(a) Familiar _____ (b) Somewhat familiar _____
(c) Not familiar _____
3. What particular activity are you pursuing in this area?
(camping, vacationing, etc.) _____

4. How well suited is the Crowsnest Pass Area for this
type of activity? (a) Excellent _____
(b) Good _____ (c) Fair _____
(d) Poor _____ (e) Not suited _____
5. What are some of the things you like most about the
area, things that you think are advantages? _____

6. What are some of the things that you don't like about
the area, things that you feel are a disadvantage? _____

7. In general, how would you rate the attractiveness of

the surrounding landscape? (a) Very attractive _____
 (b) Attractive _____ (c) Somewhat attractive _____
 _____ (d) Not attractive _____

8. As a tourist and recreational area, do you think it has:

- (a) Great potential _____
 (b) Some potential _____
 (c) No potential _____
 (d) Don't know _____

9. Were you aware that the Crowsnest Pass Area was a coal mining centre before you passed through here?

Yes _____ No _____

10. Have you seen a surface (strip or open-pit) coal mining operation here in this area?

Yes _____ No _____

11. If you answered yes to question No. 10, then please answer questions 11, 12, 13, and then move to question 14.

11. If you answered no to question No. 10, then please move to question 14.

11. Do you feel that surface coal mining (strip or open-pit) does any damage to the environment of the Pass Area? Yes _____ No _____ Don't know _____

If yes, what damages do you feel are most serious, (please list in order of importance, if possible).

12. How serious do you feel is the damage done by surface coal mining in this area?

- (a) Very serious _____ (b) Somewhat serious _____
 (c) Not serious _____ (d) Don't know _____

13. Do you think the benefits from surface coal mining are greater than the damage caused by the mining operation?

- (a) Yes _____ (b) No _____
 (c) About the same _____ Don't know _____

14. If this area was further developed to attract the tourists and recreationists, do you think this would be a successful venture?

Yes _____ No _____ Don't know _____

If yes, why? _____

If no, why? _____

15. That is just about everything except for a few facts about yourself. How long do you plan to be in the Pass Area (approximately)?

Hours _____ or Days _____

16. What is your:

(a) Occupation _____

(b) Highest level of education attained _____

(c) Age _____

(d) Approximate annual income (Husband and Wife) _____

(e) Sex: Male _____ Female _____

17. Additional comments: _____

18. To be completed before and after questionnaire.

Date Issued _____

Time of Day _____

Date Received _____

TOURIST QUESTIONNAIRE

This area is known as the Crowsnest Pass Area. It can be visualized as a circle with the centre at the Frank Slide and a radius of about thirty-five miles. As you pass through this area take note of the surroundings and then answer the questionnaire. Your response will be kept confidential but it is vital in determining how people view the area. Please mail back the questionnaire in the return envelope provided. Thank you.

Wes Hadikin, Researcher,
University of Alberta.

1. Your home address is: Town (City) _____
Province or State _____
2. How familiar are you with this area?
Familiar _____ Somewhat familiar _____
Not familiar _____
3. What are some of the things you like most about the area, things that you think are advantages?

4. What are some of the things that you don't like about the area, things that you feel are a disadvantage?

5. In general, how would you rate the attractiveness of the surrounding landscape?
(a) Very attractive _____
(b) Attractive _____
(c) Somewhat attractive _____
(d) Not attractive _____
6. As a tourist and recreational area, do you think it has:
(a) Great potential _____
(b) Some potential _____
(c) No potential _____ Don't know _____

7. Were you aware that the Crowsnest Pass Area was a coal mining centre before you passed through?

Yes _____ No _____

8. Have you seen a surface (strip or open-pit) coal mining operation here in this area? Yes _____ No _____

If you answered Yes to question No. 8, then please answer questions 9, 10, 11, and then move to question 12.

If you answered No to question No. 8, then please move to question 12.

9. Do you feel that surface coal mining (strip or open-pit) does any damage to the environment of the Pass Area? Yes _____ No _____ Don't know _____

If yes, what damages do you feel are most serious.
(Please list in order of importance, if possible.)

10. How serious do you feel is the damage done by surface coal mining in this area?

(a) Very serious _____

(b) Somewhat serious _____

(c) Not serious _____

(d) Don't know _____

11. Do you think the benefits from surface coal mining are greater than the damage caused by the mining operation?

(a) Yes _____ (b) No _____

(c) About the same _____ (d) Don't know _____

12. If this area was further developed to attract the tourists and recreationists, do you think this would be a successful venture?

Yes _____ No _____ Don't know _____

If yes, why? _____

If no, why? _____

13. That is just about everything except for a few facts about yourself. How long do you plan to be in the Pass Area (approximately)?

Hours _____ or Days _____

14. What is your:

(a) Occupation _____

(b) Highest level of education attained _____

(c) Age _____

(d) Approximate annual income (Husband and Wife) _____

(e) Sex: Male _____ Female _____

15. Additional comments: _____

Thank you

16. To be completed before and after questionnaire.

Date Issued _____

Time of Day _____

Date Received _____

APPENDIX IV

RESOURCE MANAGEMENT QUESTIONNAIRE

In answering the questions consider the Crowsnest Pass Area as a circle with the centre at the Frank Slide and a radius of about thirty-five miles.

Name: _____

Position: _____

Department: _____

Date: _____

1. Do you feel surface mining for coal does any damage?

Yes _____ No _____ Don't know _____

If yes, list some of the damages, in order of importance, that you feel occur _____

If no, why do you feel this way about the issue? _____

2. How serious do you think the damages are to the whole Crowsnest Pass Study Area? _____

3. Are the benefits from the surface mining operation greater than the damages inflicted on the environment of the area? _____

4. Do you feel reclamation is necessary? (comment) _____

5. Has there been enough reclamation carried out in the Pass area? (Comment) _____

6. What kind of reclamation is possible in the mountainous areas such as the Pass? _____

7. Is the provincial legislation, as it stands now, adequate to cope with strip mining problems? _____

8. Would you make any particular changes in the legislation? _____

9. Can you see any other land use besides coal mining that may contribute significantly to the Pass area economy? _____

10. Is surface mining and tourist and recreational land use compatible in the described area? _____

11. What type of future development do you see for the Crowsnest Pass Area? _____

APPENDIX V

PRESENT COAL MINING LEGISLATION AND SOME PROBLEMS

The following legislation and regulations apply in some way, to regulation of mines in respect to watershed protection pollution prevention, and land restoration:

The Coal Mine Regulation Act

The Surface Reclamation Act

The Mineral Surface Lease Regulations

The Right of Entry Arbitration Act

The Forest Protection Regulations

The Public Health Act

The Fisheries Act (Federal)

The Coal Mines Regulation Act, enacted in 1955 and amended in 1966, is administered by the Department of Mines and Minerals. It applies mainly to safety of mine employees and qualifications needed for each job. The Surface Reclamation Act applies to the reclamation of mines on surveyed lands in the Province of Alberta and is also administered by the same department. Elsewhere in the province the same responsibility comes under the Mineral Surface Lease Regulations, which is administered by the Department of Lands and Forests. The Right of Entry Arbitration Act can be appealed to by mine operators to allow them to operate mines in any part of the

Province of Alberta, including those areas in the Forest Reserve. This Act is administered by the Department of Mines and Minerals and apparently can overrule the Mineral Surface Lease Regulations.

Surveyed Lands

Most of the surveyed land on which mining can take place is in the Plains but there is some surveyed land in the mountain areas. The land is usually owned outright by the operator but, in some cases, he can make an agreement with the surface owner to remove the coal. Conservation and reclamation of these lands fall under the jurisdiction of the Surface Reclamation Council, which was established by the Surface Reclamation Act. Some members of the council are appointed by the municipalities and others by the Department of Mines and Minerals with Deputy Minister of the Department automatically the Chairman. The members appointed are not required to have any particular professional qualifications and are classified as "practical experienced men" (A.L.P.S., 1969, p. 13).

In the appraisal of reclamation of a mine, one member from the Department and one from the municipality are involved in judging whether the landscape has been left in a suitable condition or not. Criteria to be applied are not set down clearly in the Surface Reclamation Act and much is left to the discretion being made by

non-professional men. This approach has been proven to be inadequate. In the January 18, 1971 edition of the Edmonton Journal, the Council was branded as "incompetent, careless, or indifferent" in issuing three reclamation certificates. Apparently the Fox Coulee Coals, Ltd., operating near Drumheller, were issued reclamation certificates for supposedly "restoring" land, when in fact they had not done so. In a district court decision, Judge H. Rowbotham of Calgary ordered the provincial government to restore the lands, since the Act clearly states that once reclamation certificates are issued, the company is free of responsibility. The Judge concluded:

Either (the Council) was incompetent, careless, or indifferent to its duties concerning the administration of the Surface Reclamation Act, or it was more concerned with assisting the operator than with the proper administration of the Act (Edmonton Journal, 1971).

Because of the mode of inspection there is no uniformity in the administration of surface mining regulations and applied reclamation criteria are vague. For example, The Coal Mines Regulation Act states, "the excavated overburden that is not backfilled shall be removed a sufficient distance from the sides to prevent undue pressure on the sides and to prevent material from falling into the pit" (221(4):67). This is a safety regulation and no further mention is made of what is to be done with the overburden. Other regulations state:

"the land on which a strip mine is located shall be back-filled and levelled as the operations progress and shall be restored as nearly as possible to its original condition" (112(2,3):42). Again it is apparent from this example that the Act can be interpreted liberally and does not offer any solid guidelines to follow. Many other regulations can be cited that fall into this same category.

Forest Reserve

The Department of Lands and Forests has the responsibility for proper reclamation procedure in the Forest Reserve. This responsibility can be by-passed by appealing to the Department of Mines and Minerals through the Right of Entry Arbitration Board. One such case occurred at the Racehorse Mine in the study area. The company, Coleman Collieries, felt that it was unable to open the mine if it were to comply with the conservation practices demanded by the Department of Lands and Forests. It appealed to the Right of Entry Arbitration Board, which overruled the former stipulations. The Company was allowed to proceed with their planned operation.

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